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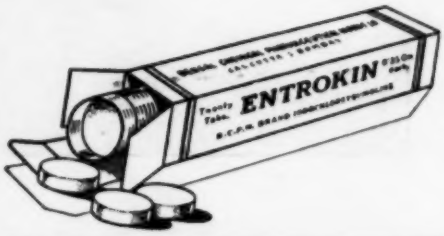

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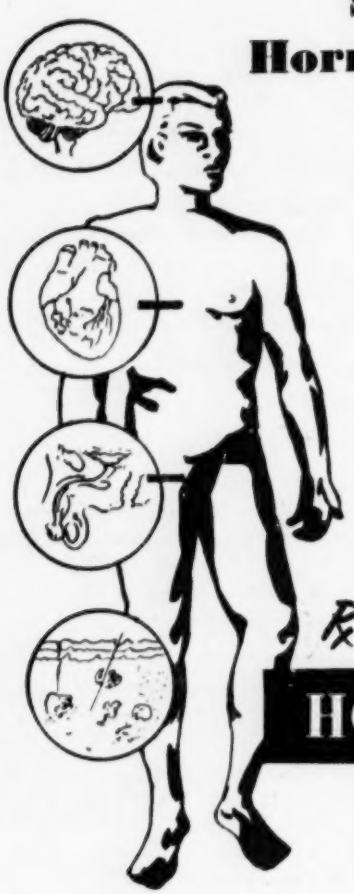

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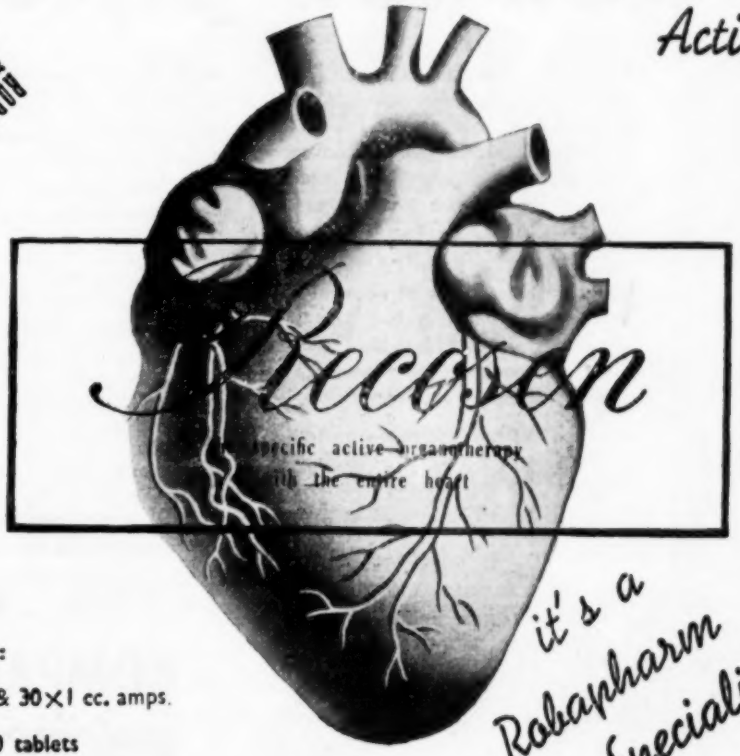

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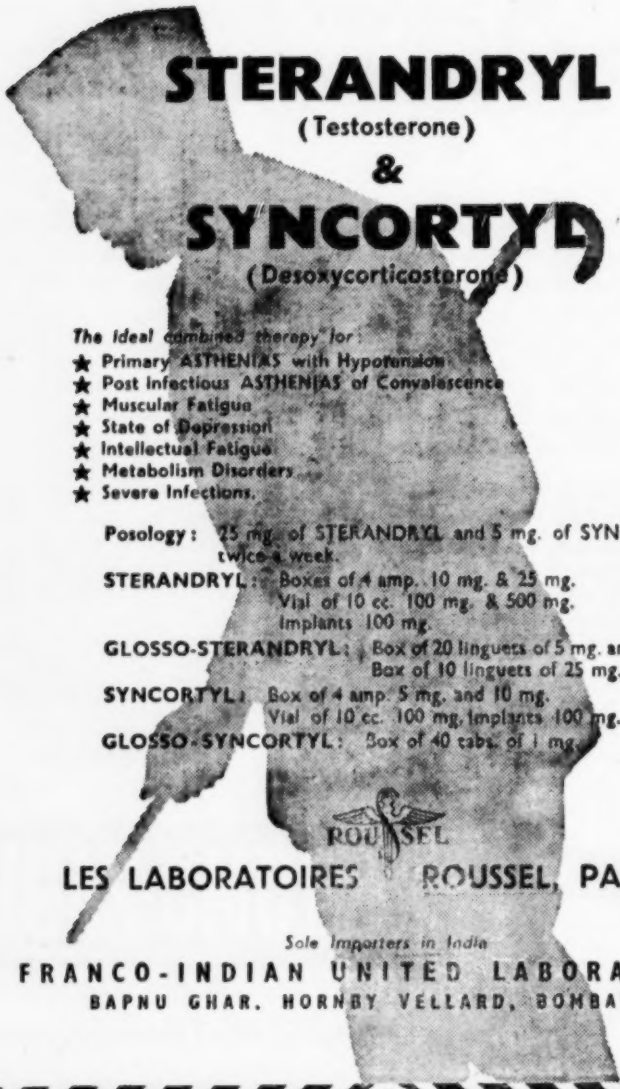

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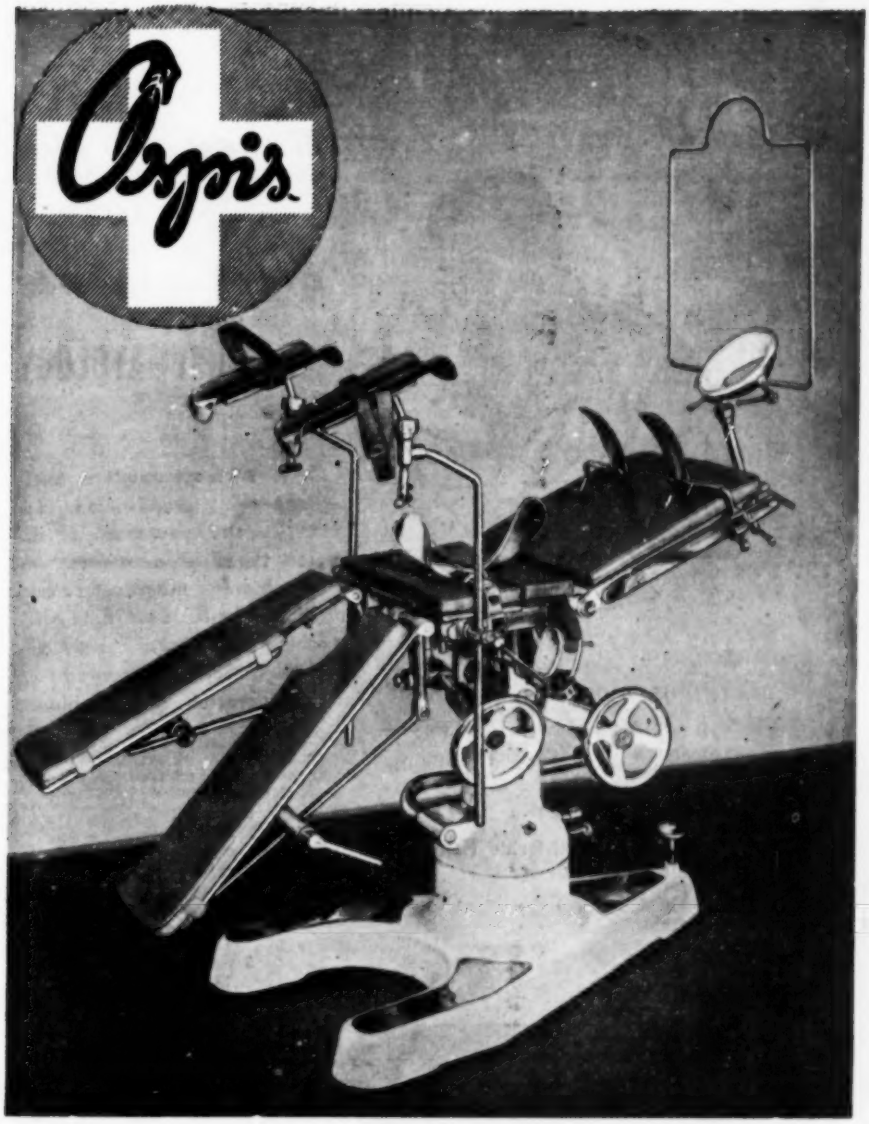

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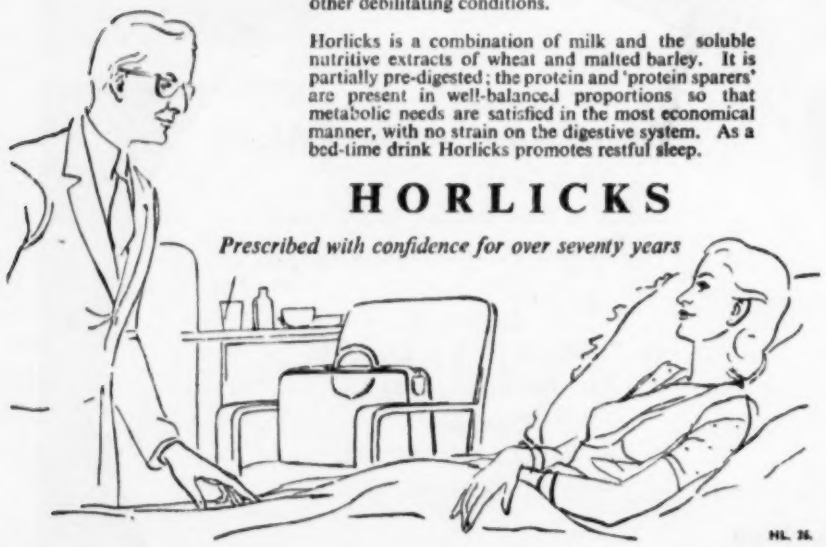

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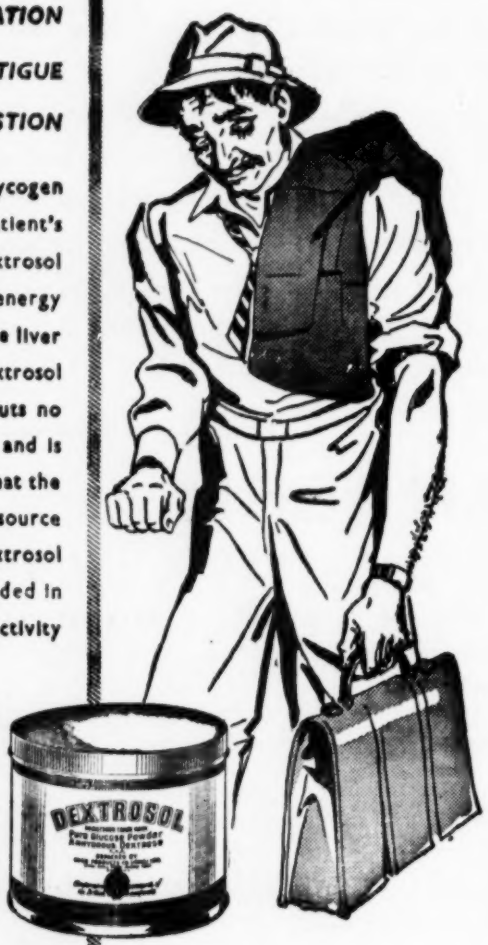

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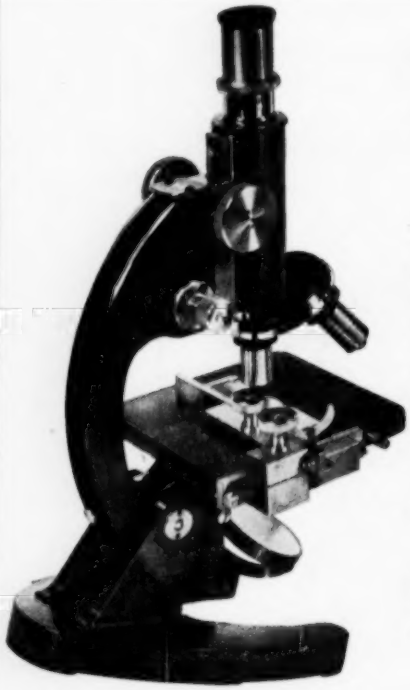

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* *'Vitamin B_{12} Research', Editorials and Comments, J.A.M.A. 153, 560, November 7, 1953.*

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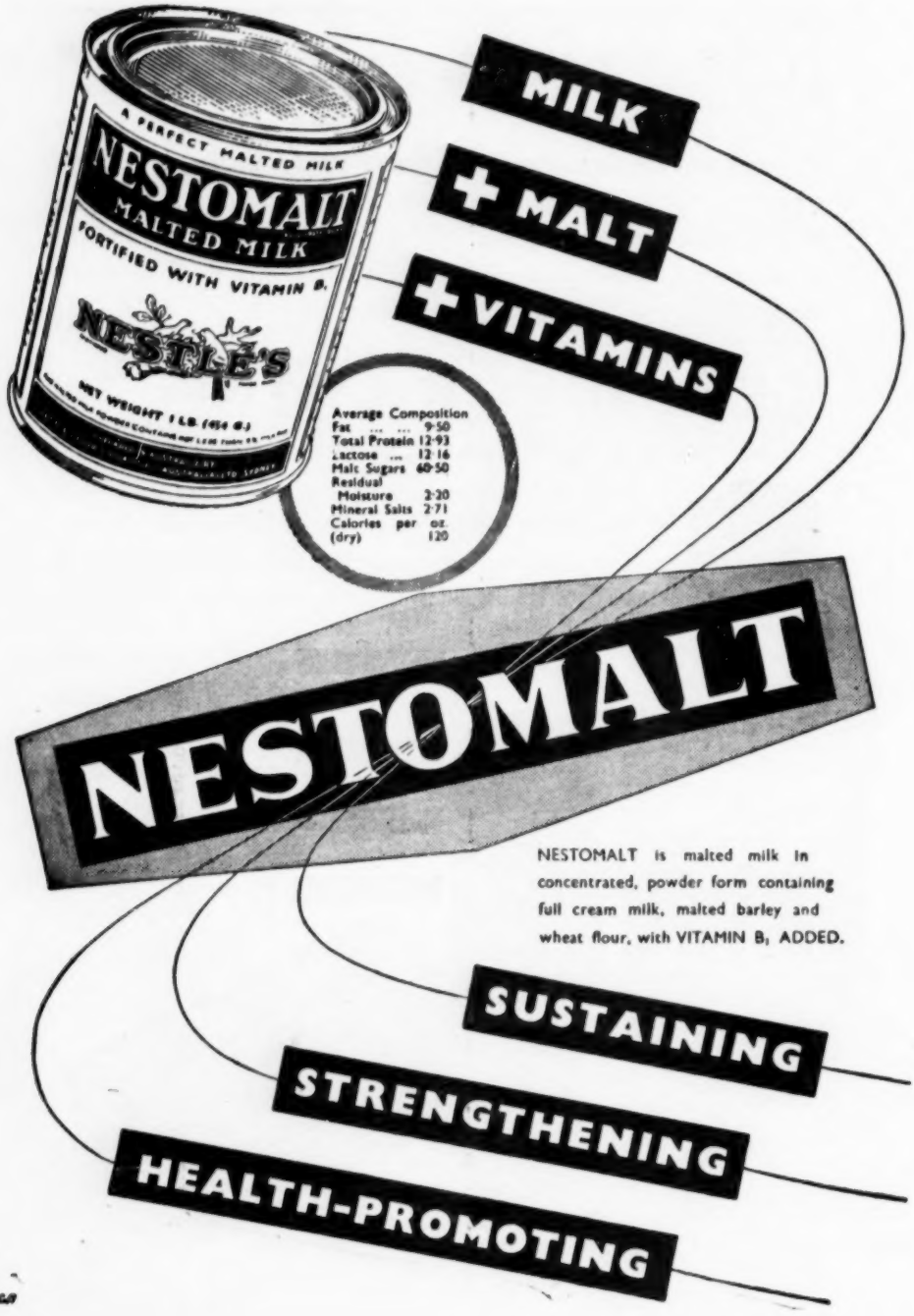
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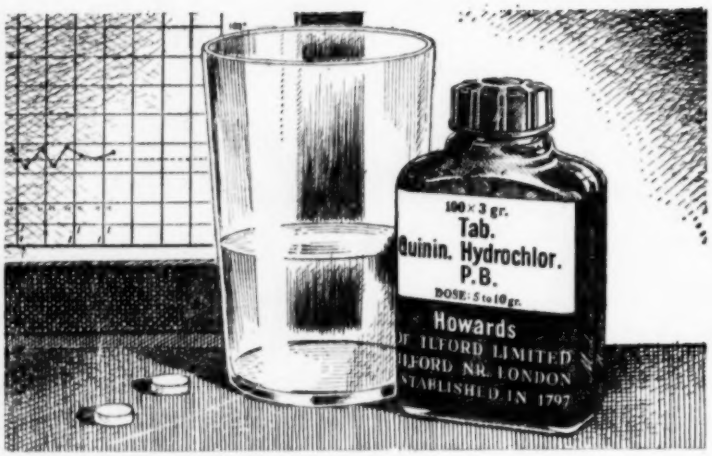

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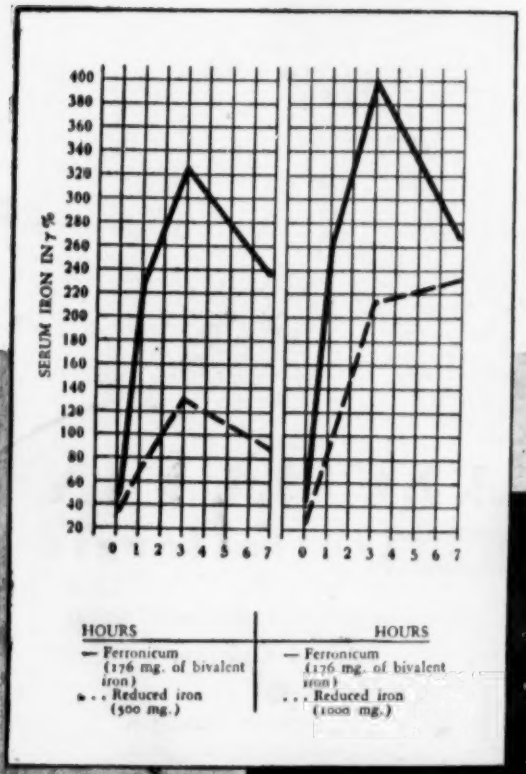

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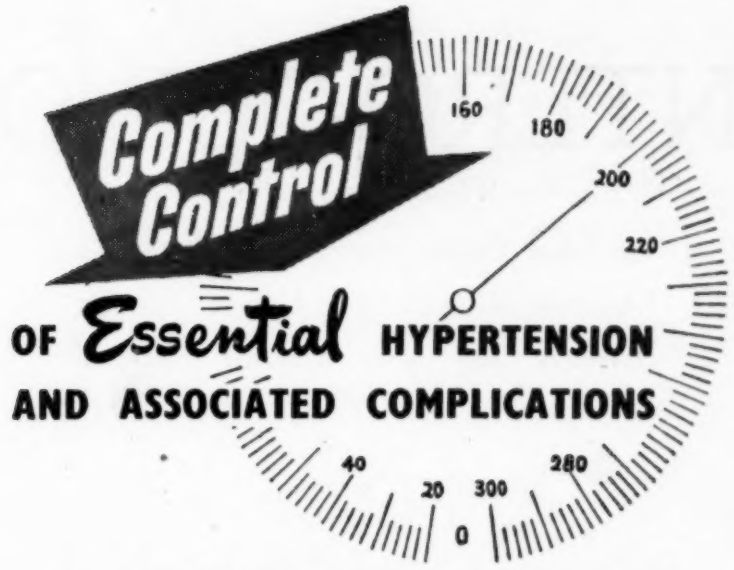

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No direct action of the *Rauwolfia serpentina* extracts was noticed on the exposed heart lung preparation.

[Kramer, Gehl, Nilsonn, Riecker & Ullrich *of the Physiological Insitute of the University of Marburg:* Klinische Wochenschrift, Germany, 31, 41/42]

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CALCUTTA—26.

Journal of the Indian Medical Association

Vol. XXIII, No. 10 CALCUTTA July, 1954

ORIGINAL ARTICLES

EXFOLIATIVE CYTOLOGY IN THE DIAGNOSIS OF CARCINOMA OF THE ORAL CAVITY

P. N. WAHI, M.D., M.R.C.P.(LOND.)

AND

KAMLA GUPTA, M.B.B.S.

(From Cancer Research Unit, Department of Pathology, S. N. Medical College, Agra)

Cytological method of diagnosis of malignancy is based on the fact that the normal epithelium of the body undergoes a continual exfoliation. This natural exfoliative property of the epithelium is increased as a result of irritation and much more so in malignancy. Reports on the application of the smear method of cytologic diagnosis of malignancy in various body secretions have appeared in the literature as far back as the last century. No standard technique was, however, developed until Papanicolaou in 1928 demonstrated the feasibility of the recognition of detached malignant cells in the vaginal smear. This method became available when he published his classical monograph on 'Diagnosis of Uterine Cancer by the Vaginal Smear' in 1943. Although it was originally outlined for the diagnosis of gynaecological malignancies, it was later with slight modifications applied by various workers for the diagnosis of malignancy in lesions of the respiratory, digestive and urinary tracts and in body fluids.

It has not been possible to find any reference in the literature to the applicability of exfoliative cytology in the diagnosis of carcinoma of the oral cavity. Since a large number of patients with oral carcinoma attend the S. N. Hospital, Agra, it was decided to evaluate the accuracy of smear diagnosis in these lesions.

Material and Methods

This investigation embodies the result of fifty clinically diagnosed or suspicious cases of oral carcinoma attending the out-patients department of the S. N. Hospital, Agra. The purpose of the study was (1) to become familiar with the cytological characteristics of the normal cells of the oral cavity; (2) to study the cytological characteristics of the cells in malignant cases; (3) to evaluate this method as a routine screening and diagnostic test.

Technique of making the smears: As a routine two smears were prepared from each case. (1) A swab was gently passed over the surface of the growth or ulcer and then uniformly smeared over a glass slide; (2) an ordinary wooden spatula was used to scrape off the surface of the lesion and a smear prepared from the scrapings. Both the slides were numbered and immersed in equal parts of absolute alcohol and ether while still wet. They were allowed to fix for a minimum of 15-30 minutes. The slides were then stained by Papanicolaou's technic.

Cytological Findings in Normal Oral Cavity: The following cells and elements may be found in the normal oral cavity:

Epithelial cells (a) Superficial squamous cells. (b) Basal cells.

Inflammatory cells e.g. neutrophils, lymphocytes, plasma cells, and histiocytes.

Connective tissue threads.

Superficial squamous cells—The superficial squamous cells are the chief constituents of a normal smear. It is extremely difficult to differentiate between a normal oral smear and a normal vaginal smear particularly that in the follicular stage. Flat polygonal cells are seen singly or in clusters, others appear folded and have a scalloped outline, while still others are curled at their free margins. Most of them contain a translucent pinkish orange, fine wrinkled cytoplasm, though various hues from pink, mauve, blue to green are seen. The nucleus is pyknotic and small in some cells while in others it is larger and somewhat vesicular. The basophilic cells tend to have a larger nucleus. Some of the cells contain multiple nuclei, giving an appearance that the chromatin has broken down and scattered all over the cytoplasm. In some cells cytoplasmic vacuoles are

seen and an occasional perinuclear vacuole is sometimes noticed (Fig. 1A, *vide* Plate).

Basal cells—Very few isolated basal cells are seen. They are much smaller than the squamous cells and are rounded to oval in shape. Two types are noticed, one is a small round basophilic cell about four times the size of a lymphocyte, the nucleus is large condensed and round and is surrounded by a narrow rim of vacuolated basophilic cytoplasm. The other bears the characters intermediate to that of the small basal cell and superficial squamous cell and may be called the intermediate type of cell. This is a comparatively larger cell with a condensed round nucleus about the same size as that seen in the small basal cell. The cytoplasm is more abundant, lighter basophilic and the shape of the cell is polygonal to oval. Occasional cytoplasmic vacuolization is seen (Figs. 1B, and 1C, *vide* Plate).

Inflammatory cells—In the normal smear a few scattered polymorphonuclear leucocytes and lymphocytes are seen. Occasional polymorphonuclear leucocytes are seen to be invading the degenerated cells of the squamous type. An occasional histiocyte is also met with.

Connective tissue threads—Fine threads of connective tissue stained blue to green are seen to connect the epithelial cells and inflammatory cells.

Smears in Non-Specific Inflammations: *Atypical epithelial hyperplasia*—The picture changes because of the large increase in polymorphonucleur leucocytes and histiocytes. Erythrocytes are frequently found in cases of ulcerations. Numerous basal cells are found in groups, the nuclei of which show a slight degree of anisocytosis and anisonucleosis but retain their normal aspect. Though some of the superficial squamous cells maintain their normal shape, most of them undergo fragmentation or are elongated and fusiform and have no clear cell outline. There is no increased tendency to basophilic staining of the cytoplasm. In most of the superficial squamous cell a larger nucleus than normal is seen. Often the nucleus is elongated or the cell binucleated. Cytoplasmic and perinuclear vacuoles are not uncommon but these are more marked in the basal cells (Figs. 2A and 2B, *vide* Plate).

Leucoplakia—In such cases about three-fourths of the superficial squamous cells stain acidophilic with curled and folded margins, and contain small pyknotic nuclei. Many are anuclear. A mixture of the above characters may also be seen as leucoplakia is usually asssociated with secondary infection.

Smears in Malignant Lesions: There is no single criterion for making a positive diagnosis of malignancy. The general picture of the smear may be just normal looking but more often it is of the inflammatory type. The diagnosis of malignancy depends on the presence of malignant cells either isolated or in groups. The classification of malignant cells may be made under two main groups—undifferentiated and differentiated. The basis for distinction between the two groups is the presence or absence of distinct cellular borders. In undifferentiated cells, the cytoplasm is an indistinct background with absence of cell borders. Differentiated malignant cells have well defined cytoplasm and fairly definite cell borders. Nuclear changes appear to be the most characteristic striking feature. The nucleus tends to be large and out of proportion to the size of the cell. The nuclei are hyperchromatic and show fragmentation, the chromatin is granular though actual mitosis is quite rare. The nucleoli are large and conspicious. Anisocytosis and anisonucleosis are seen. This feature is well marked when groups of malignant cells are seen and is an additional criterion in the diagnosis of malignancy. The cytoplasm tends to be dense and basophilic and may show pronounced vacuolization and inclusion of polymorphs and lymphocytes. Smears from malignant lesions invariably contain numerous leucocytes, histiocytes and red blood cells. There is also a certain degree of secondary infection present (Figs. 3A and 3B, *vide* Plate).

Results

In this study, till date, 50 cases, clinically diagnosed or suspicious, of oral carcinoma were examined. On an average two smears—a swab smear and a scraping smear—were prepared in each case and correlated as far as possible with the biopsy. Table 1 gives the analysis of these cases.

Table 1—Showing Analysis of Results of 50 Cases

Total cases examined	...	...	...	50
Clinically diagnosed:				
Positive	...	...	...	37
Suspicious	...	...	...	11
Negative	...	...	...	2
Biopsy reported:				
Positive	...	...	...	30
Negative	...	...	...	9
Not done	...	...	...	11
Smear reported:				
Positive	...	...	...	41
Negative	...	...	...	9

Of the nine negative smears diagnosed, seven were proved negative by the biopsy report. In two cases biopsy was not done, one of these was clinically diagnosed leucoplakia, the other was a firm, indurated and glazed area at the base of the tongue at the site of a previously excised growth two years back. The patient refused to have the biopsy done. There was no way of confirming the smear findings.

Of the nine negative biopsies reported, seven were confirmed by negative smear reports. The two unconfirmed cases were diagnosed positive both clinically and by smear. The biopsy diagnosis in one was—"no epi-

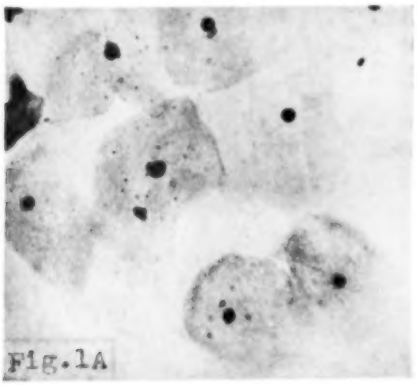

Fig. 1A—Normal flat polygonal superficial squamous cells seen in a swab smear from a normal case. Papanicolaou's staining method × 430.

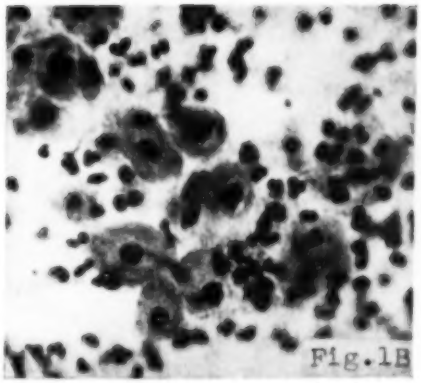

Fig. 1B—Intermediate type of squamous cells with a condensed nucleus and relatively less cytoplasm. These usually stain basophilic. Papanicolaou's staining method × 430.

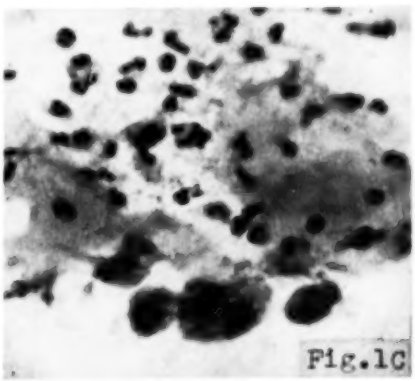

Fig. 1C—Small round and oval basal cells with a large nucleus and a narrow rim of cytoplasm. Papanicolaou's staining method × 430.

Fig. 2A—Cluster of superficial squamous cells with no definite cellular outline and marked invasion by leucocytes. Papanicolaou's staining method × 430

Fig. 2B—Group of small atypical basal cells showing various shapes e. g., fusiform, elongated and irregular. The nucleus retains its normal character. Papanicolaou's staining method × 970.

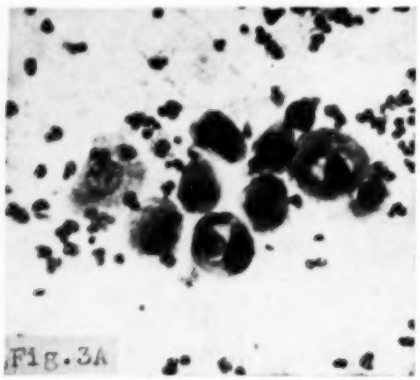

Fig. 3A—Group of differentiated malignant cells. Each has a definite cellular outline. Marked anisocytosis and anisonucleosis seen. There is also hyperchromatism and perinuclear and cytoplasmic vacuolization. Papanicolaou's staining method × 430.

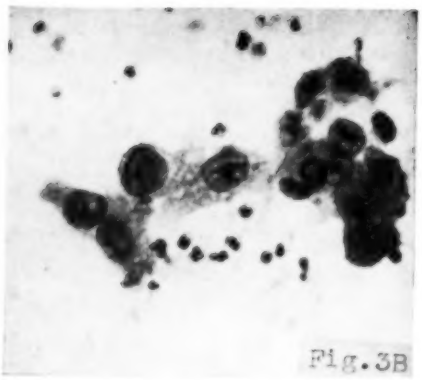

Fig. 3B—Group of undifferentiated malignant cells showing a hazy cytoplasmic background and nuclei presenting all the malignant characteristics. Papanicolaou's staining method × 430.

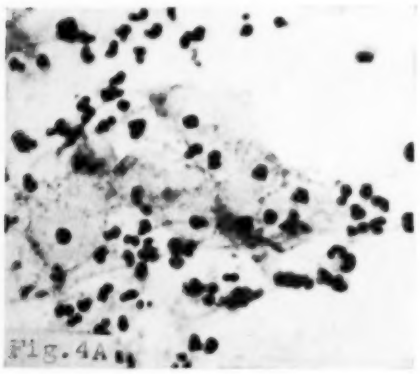

Fig. 4A—Group of superficial squamous cells showing the characteristics of a non-malignant smear. Papanicolaou's staining method × 430.

Fig. 4B—Biopsy from the same case as in Fig. 4A showing a squamous papilloma. Hæmatoxylin and Eosin × 50.

Fig. 5A—Group of malignant cells in the swab smear. Papanicolaou's staining method × 430.

Fig. 5B—Sheet of malignant cells in the scraping smear of the same case as in Fig. 5A. Papanicolaou's staining method × 430.

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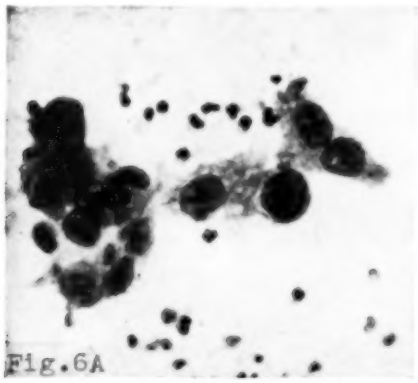

Fig. 6A—Group of undifferentiated malignant cells seen in the swab smear. Papanicolaou's staining method × 430.

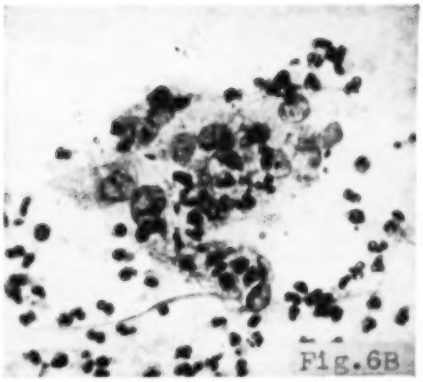

Fig. 6B—Sheet of malignant cells with invading polymorphs seen in the same case as in Fig. 6A in a scraping smear. Papanicolaou's staining method × 430.

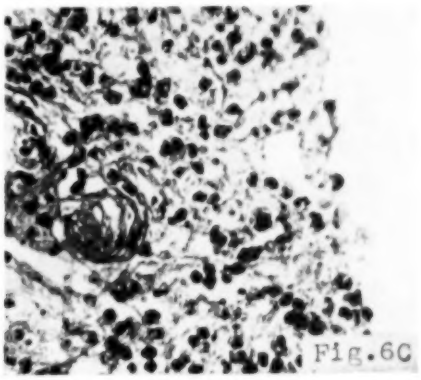

Fig. 6C—Biopsy from the same case as in Figs. 6A and 6B. Epidermoid carcinoma. Hæmatoxylin and Eosin × 430.

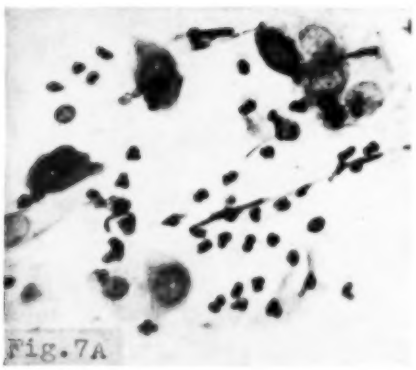

Fig. 7A—Scattered malignant cells in the swab smear. Papanicolaou's staining method × 970.

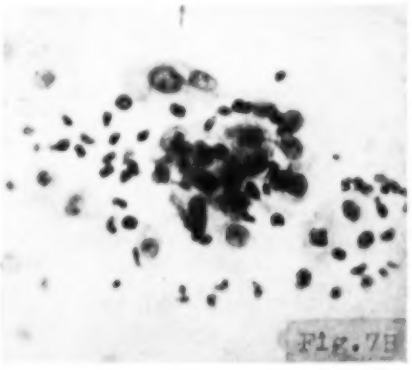

Fig. 7B—Group of malignant cells with leucocytic infiltration in the scraping smear of the same case as in Fig. 7A. Papanicolaou's staining method × 430.

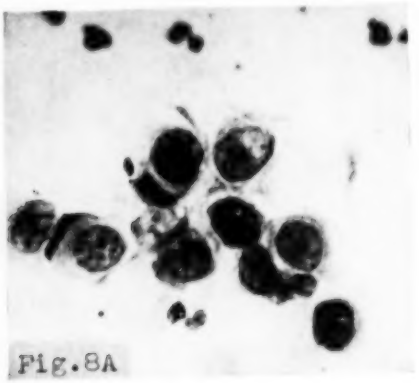

Fig. 8A—Group of undifferentiated malignant cells in the swab smear. Papanicolaou's staining method × 970.

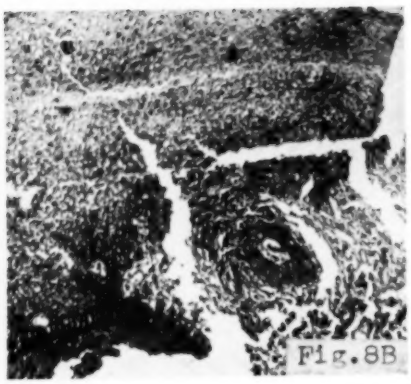

Fig. 8B—Biopsy from the same case. Epidermoid carcinoma. Hæmatoxylin and Eosin × 100.

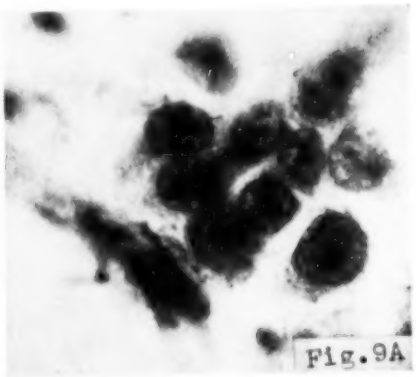

Fig. 9A—Undifferentiated malignant cells in the swab smear showing marked increase in size of the nucleoli. Papanicolaou's staining method × 970.

Fig. 9B—Malignant cells in the scraping smear of the same case as in Fig. 9A showing the same characters and also thickening of the nuclear membrane. Papanicolaou's staining method × 970.

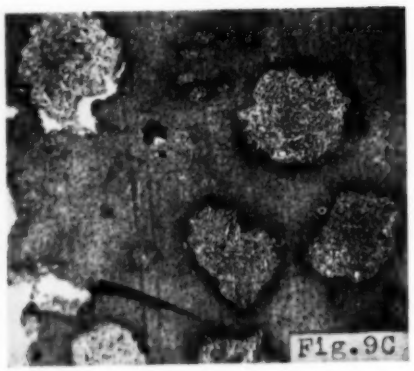

Fig. 9C—Biopsy from the same case showing atypical epithelial hyperplasia. Hæmatoxylin and Eosin × 100.

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thelium seen, hence no opinion could be given", the other was reported "atypical epithelial hyperplasia". Both cases were treated by deep x-rays, as the radiologist was certain of the clinical diagnosis.

In the eleven cases where biopsy was not done, nine were diagnosed positive both clinically and by smear. In the two cases where smear was negative, one was clinically leucoplakia and the other was clinically suspicious carcinoma, because of a hard indurated area at the site of a previously surgically excised growth. In this case there are two possibilities, the present lesion was an overgrowth of scar tissue and therefore no malignant cells were detected in the smear or secondly the lesion was not ulcerated and hence no exfoliation of cells occurred.

Case Reports

Case 1—A Muslim female aged 50 years came with a large nodular growth involving the left angle of the mouth and spreading on to the mucus surface of the cheek and involving the lower gum. She gave a history of having started it as a small nodule on the lower lip since 8-9 months. There was excessive pain and inability to open the mouth fully. No glands were involved. Clinically she was diagnosed as a case of cancer cheek and lip. Both the swab and scraping smears were negative for malignant cells. This was confirmed by a biopsy diagnosis of squamous papilloma (Figs. 4A and 4B, *vide* Plate).

Case 2—A Sikh male aged 40 years complained of having recurrent ulcers in the oral cavity for the last 8 years, with excessive pain and salivation for the same duration. An ulcer involving the posterior part of the right cheek and lower wisdom tooth area was seen. His right submandibular glands were palpable, clinically cancer cheek was diagnosed. Both the swab and scraping were positive. The biopsy showed no epithelium hence no opinion could be given. He was given deep x-ray therapy (Figs. 5A and 5B, *vide* Plate).

Case 3—A Hindu male aged 50 years came with an ulcer of the right cheek. He complained of excessive pain and salivation with foul discharge since 3 months. Right submandibular glands were palpable. Clinical diagnosis was (?) cancer cheek. Both the swab and scraping showed groups of malignant cells. The biopsy taken at the same time showed no epithelium, only acute and chronic granulation tissue was seen. In view of the positive smear a second biopsy was taken which confirmed the diagnosis of epidermoid carcinoma (Figs. 6, 6B and 6C, *vide* Plate).

Case 4—A Hindu male aged 32 years came with the complaints of excessive pain in his throat and salivation since 1½ months. He gave a history of having had syphilis a year back. Clinically a raw ulcer involving the right tonsillar area was seen, submandibular glands were palpable and a diagnosis of (?) cancer pharynx, (?) syphilitic ulcer was given. Biopsy was not done for fear of bleeding. Both swab and scraping smears were positive. The patient was treated with deep x-rays (Figs. 7A and 7B, *vide* Plate).

Case 5—A Hindu male aged 44 years came with the complaints of pain during deglutition for 2 years and expectoration for the same duration. On examination both the tonsils were seen to be very much hypertrophied, nearly meeting in the midline and very congested. There was no visible pharyngeal growth. Clinically it was diagnosed (?) cancer pharynx. A blind swab was taken which was positive for malignant cells. A biopsy from the suspected hypertrophied area on the tonsil showed epidermoid carcinoma (Figs. 8A and 8B, *vide* Plate).

Case 6—A 50 year old Muslim female came with the complaints of pain and ulceration of the tongue for 1 year, excessive salivation and difficulty in swallowing since 2 months. A year back she noticed a small nodule on the left side of the tongue which had taken the shape of an ulcer ¾" × 1½" on the left margin of the tongue. Submandibular glands were palpable. Clinical diagnosis was cancer tongue. Both swab and scraping were positive. The biopsy showed atypical epithelial hyperplasia only (Figs. 9A, 9B and 9C, *vide* Plate).

Comments

No definite conclusions can be reached from this study because of the relatively small number of cases comprising it. However, as this method of diagnosis of oral carcinoma has not received any attention as compared to its wide use in the diagnosis of cervical carcinoma and to a less extent in other body fluids, it is considered that the presentation of this series may make a useful contribution.

From the results, it is clear that the recognition of malignant cells in the smears from oral carcinomas, is feasible. It is a simple, quick and an inexpensive method and can be repeated as often as necessary without any inconvenience to the patient. It is therefore particularly adapted to the screening of a large number of patients in cancer—detection clinics especially in areas, where facilities for biopsy are not available. Cases so screened can then be submitted to histological examination.

Summary and Conclusions

From the results of this investigation it can be concluded that it is definitely possible to recognise the presence of malignant cells in smears prepared from the lesions in the oral cavity and fixed and stained by Papanicolaou's method.

The description of cellular elements found in the smears prepared from the oral cavity is given.

The diagnostic criteria for malignant cells in oral carcinoma are presented.

The results of the smear examination for diagnosis of malignant lesions of the oral cavity are considered, as good as biopsy results, if not better. The technique is comparatively simple and more applicable to detection clinics. Cases so screened can be referred to a surgical pathology laboratory for additional confirmation by examination of the biopsy.

In cases where smear is positive and the biopsy is negative, a repeat biopsy is advisable.

References

Papanicolaou, G. N. and Traut, H. F.—Diagnosis of Uterine Cancer by the Vaginal Smear, 1943, Commonwealth Fund; London: Oxford.

OBSERVATIONS ON SOME ENDOCRINE CHANGES UNDER LOW ATMOSPHERIC PRESSURE SIMULATING HIGH ALTITUDE

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Introduction

The reaction of an animal exposed intermittently to low oxygen tension is of special interest in physiology since aviators are likely to expose themselves to this form of 'stress' unless special precautions are taken to keep them adequately supplied with oxygen. Experimental works on this line done by Armstrong *et al* (1938), Sundstroem and Michaels (1942), Lewis and his co-workers (1942) and Gorden *et al* (1943) have led to the view that the picture presented by the animals when exposed to intermittent anoxia for days resembles in general to that of general adaptation syndrome as described by Selye (1950) with its three stages in which there occur a brief initial phase of shock followed by a stage of resistance of variable duration and ultimately a stage of exhaustion terminating in death of the animal. Such a reaction can be obtained by various types of 'stressor' and adrenal cortex plays an important role in these responses. Thus it has been shown that during the resistant stage the adrenal cortex undergoes hepertrophy and hyperplasia and in the stage of exhaustion degenerative changes appear in the cortex. Changes have been described in the anterior pituitary under similar conditions by Schubothe (1940), Pomerat and Haverath (1942) and by Gordon and his co-workers (*loc. cit.*). Their work indicates that the adrenocortical changes are secondary to the changes in the pituitary which responds to the 'stress' in the first instance by liberating larger amount of corticotrophins.

It is a well-established observation that the people living at high altitudes have got a lower potency of their gonads and that the animals living at high altitudes show much less fertility that those living on the plains. Experiments with low pressure chamber done by Dohan (1942) and by Gordon *et al* (*loc. cit.*) indicate that when the animals are exposed to low oxygen tension there occur a decrease in their testicular weight and inhibition of spermatogenesis. The current investigation is concerned with an examination of the effects of low atmospheric pressure simulating high altitude on the endocrines mentioned above and on the body weight.

The results were compared with another group of rats which received vitamin E injection daily while being subjected to the same experimental procedure.

Materials and Methods

Adult male rats of a closely inbred type were used in these experiments. All the rats were fed with regular laboratory ration and were weighed daily before they were placed into a low pressure chamber. The latter was constructed from a large vacuum desiccator with soda-lime for absorption of the CO_2. A steady ventilation rate of 50 litre of air per minute was maintained and any undue fluctuation of the temperature of the chamber was prevented by a water jacket through which water was kept in circulation.

Three groups of rats were used in this experiment. First group served as control. Their daily weights were recorded for a period of 12 days when some of them were killed and their tissues were examined histologically. The second group of rats were exposed to a simulated altitude of 30,000 ft. for two hours a day. Most of these rats maintained a constant body-weight for about 3 or 4 days, (stage of resistance?), after which they began to lose weight at first slowly then more rapidly (stage of exhaustion?) till they died (by about 12th day). Some of these rats were killed on the 4th, or 5th, day of the exposure (end of stage of resistance) and the tissues were subjected to histological examination. The other rats of this group were killed on the 12th day (or earlier if dead) and the tissues examined in the same way. A third group of rats were treated exactly like the second group but received 30 mg. of vitamin E by injection (intramuscular), daily. The survival period of these rats were greatly prolonged and they were killed on the 12th day and their tissues were examined microscopically.

Tissues were fixed in formol saline for 48 hours, and then weighed in a semi-microbalance. Paraffin sections were used as a rule. Eosinophilic counts of blood were done after the method described by Thorn *et al* (1950). The blood was collected from the tails one hour after the exposure.

Results

Body-weight:

The changes in the body-weight in all the three groups are given in Table 1. The observations were restricted to a period of 12 days.

Histological Structures:

1. *Suprarenal Cortex*—The suprarenal cortex of the anoxic group of rats was examined in three different stages of anoxic exposures. The results are indicated below:

(a) Rats Killed Immediately After the Second Exposure: There was no gross structural abnormality except that the cells were vacuolated and the section had a 'honeycomb' appearance (Fig. 3, *vide* Plate). The sudanophilic granules in the cortex had lost their organised structure and were in the stage of dissolution (Fig. 2, *vide* Plate) indicating active secretion of the corticosteroid.

(b) Rats Killed on the 5th or 6th Day of Exposure: There was hypertrophy of the suprarenal cortex which undoubtedly accounted for the increase in weight of the gland. The zona glomerulosa was rather

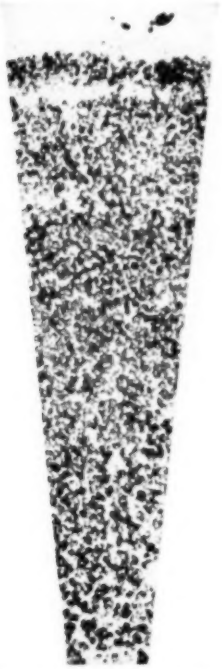

Fig. 1—Suprarenal cortex. Normal distribution of the sudanophilic granules.

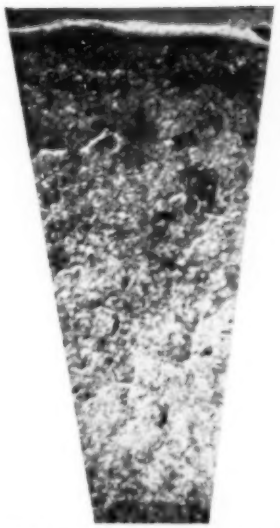

Fig. 2—Suprarenal cortex. Dissolution of granules after anoxic exposure. (Rat No. 15)

Fig. 3—'Honeycomb' appearance of suprarenal cortex after anoxia (Rat No. 15)

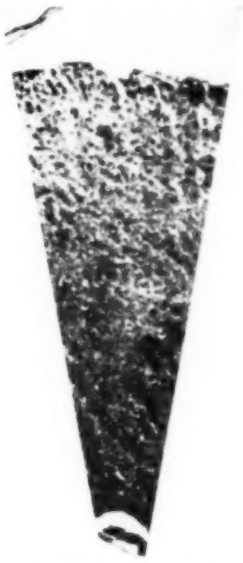

Fig. 4—Hyperplasia of the cortex in the stage of resistance (Rat No. 19A).

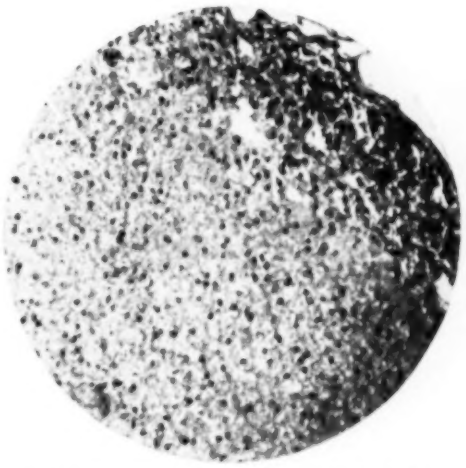

Fig. 5—Coagulative necrosis of the whole of the cortex (stage of exhaustion). (Rat No. 11A).

Fig. 6—Same specimen as in Fig. 5 under [illegible] power.

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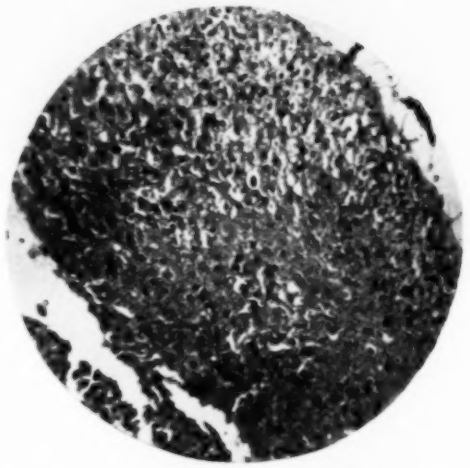

Fig. 7—Degeneration of the zona fasciculata (exhaustion stage). (Rat No. 6A).

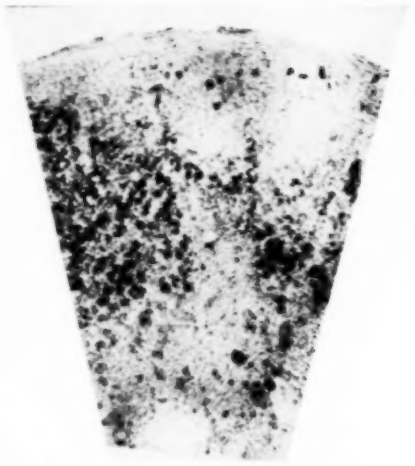

Fig. 8—Disappearance of the sudanophilic granules. (Rat No. 11A).

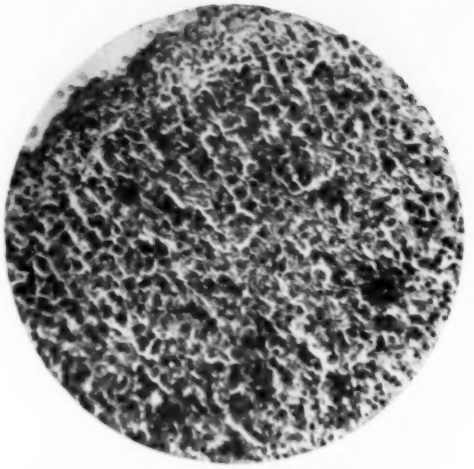

Fig. 9—Suprarenal cortex of rat receiving vitamin E in addition to anoxia. Note the normal appearance. (Rat No 22E).

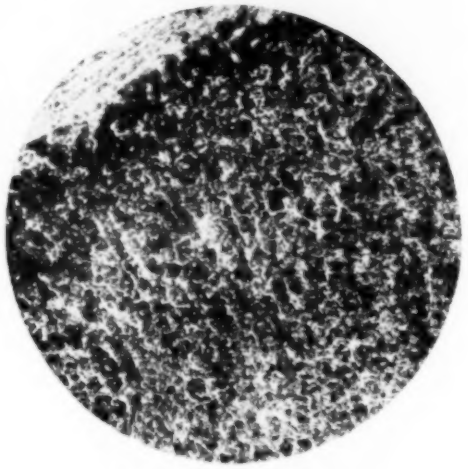

Fig. 10—Sudanophilic granules after 12th exposure (Rat No. 22E).

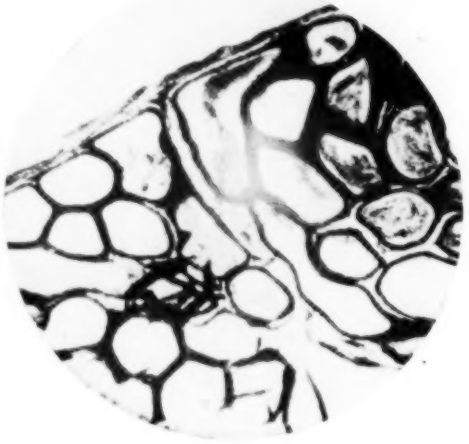

Fig. 11—Showing complete degeneration of the testes after anoxia. (Rat No. 4A).

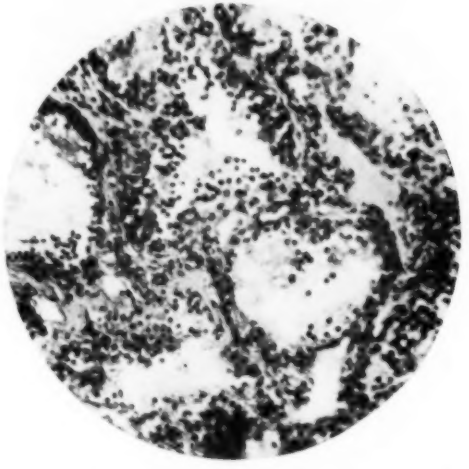

Fig. 12—Testes after 12th exposure and vitamin E injection. (Rat No. 23E).

TABLE I

	Average initial weight (g.)	*Average final weight (g.)*	*Average weight gained or lost (g.)*	*Testicular Wt. (mg.)/ Body Wt. (g.)*	*Suprarenal Wt. (mg.)/ Body Wt. (g.) × 100*
GROUP I Control (8)	199·4 ± 30·1 (171 – 250)	202 ± 31·3 (173·5 – 251·5)	+ 2·6 + (1·3%)	10·6 ± 0·3 (9·9 – 11·1)	8·1 ± 1·1 (6 – 9·6)
GROUP II Discontinuous exposure 12 day (14)	243·5 ± 20·6 (219 – 280)	209 ± 16 (200 – 230)	− 34·5 − (12·9%	8·3 ± 0·4 (7·5 – 9)	14 ± 1 (12 – 16)
GROUP III Exposure & Vit. E. (7)	230 ± 30·5 (170 – 260)	248·25 ± 33·1 (182 – 283)	+ 18 + (7·8%)	9·1 ± 1 (7·3 – 11·3)	15·1 ± 1·2 (14 – 11·2)

Figures in parentheses: Col. 1—No. of rats. Col. 4—Variation expressed as per cent. In other cols. the figures indicate range of variation.

thin whereas the cells of the zona fasciculata as well as the cells of the deeper layer were increased in number, the latter resulting in the loss of well-known reticular appearance of the corticomedullary junction.

(c) RATS KILLED ON THE 12TH DAY WHILE MORIBUND OR EARLIER IF DEAD: There was more or less widespread degeneration of the suprarenal cortex. In the microphotograph presented it will be seen that in one case (Rat No. 11A, Figs. 5 and 6, *vide* Plate) the whole of the suprarenal cortex was involved in coagulative necrosis where the cellular outlines were lost and the nuclei were in different stages of disintegration. In another case (Rat No. 6A, Fig. 7, *vide* Plate) the fasciculated zone was typically the site of most marked and widespread degeneration reminding one of the 'holocrine' type of glandular secretion where the cells disintegrate to discharge their contents.

The sudanophilic granules disappeared almost completely from such section (Fig. 8, *vide* Plate).

(d) RATS RECEIVING 30 MG. OF VITAMIN E DAILY BEFORE EXPOSURE: In this group the suprarenal glands were examined on the 12th day of exposure. The rats were still gaining in weight and healthy at that time. There was remarkable proliferation of the adrenocortical cells which seemed to be most marked in the fasciculated zone. There was comparative thinning of the zona glomerulosa and loss of reticular appearance of the corticomedullary junction due to cellular proliferation. There was relative abundance of the socalled 'dark cells' in this area which in normal specimens are rather scanty.

Examined twenty-four hours after the 12th exposure the suprarenal cortex of these rats showed the presence of sudanophilic granules of normal distribution (Fig. 10, *vide* Plate).

Though the suprarenal medulla was not the subject matter of study in some of the specimens of this last group the cytoplasm took up eosinophilic stain and the nuclei appeared condensed.

2. *Testes*—Microscopical examination of the testes of the rats intermittently exposed to a simulated altitude of 30,000 ft. invariably showed different grades of degeneration of the germinal epithelium, Leydig's cells being comparatively unaffected. The spermatozoa and the spermatids showed extensive degeneration in every case. The spermatocytes showing polychromasia of the cytoplasm and chromatolytic and pyknotic changes in the nuclei. Large polynucleated spermatocytes were common. The spermatogonia were more resistant to anoxic stress. The Sertolian syncytium was last to disintegrate. In two cases the seminiferous tubules showed complete degeneration of all the epithelial elements. In these cases the connective tissue frame work of the seminiferous tubules were hypertrophied and were incompletely filled with a homogenous eosinophilic mass, representing the debris of the degenerated germinal epithelium (Fig. 11, *vide* Plate). Interstitial cells were absent in these specimens. It must be emphasised that it was not possible for us to correlate always the degree of testicular degeneration with the number of exposures. Thus in some of the rats examined in the resistant stage and killed on the 5th day the testicular degenerations were more advanced than those of the terminal state.

None of the rats which received vitamin E showed such serious grade of testicular degeneration. The microphotograph shows one of the common pictures seen in this group. In many specimens the spermatocytes were less affected and spermatozoa were present in a few. Interstitial cells were not affected. But in

view of the rather inconstant nature of the testicular changes in the second group of rats which did not receive any vitamin injection, it was not possible to evaluate with certainty how far vitamin E could prevent the anoxic damage to the seminiferous tubule.

(3) *Pituitary*—ANOXIC GROUP (GROUP II): The characteristic structural change in the pituitary of the anoxic rats consisted in marked proliferation of the basophils associated with proportionate diminution of the acidophils, the number of chromophobes remaining practically unaltered. The basophils were enlarged, vacuolated and showed loss of granules, suggesting high degree of secretory activity.

ANOXIC WITH VITAMIN E GROUP (GROUP III): In this group, too, the basophilia of the pituitary was present but was accompanied with increase in the number of the eosinophilic cells with a proportionate diminution of the number of chromophobes.

The result of the differential cell count of the cells of the anterior pituitary of these three groups of rats is given in Table 2. In each group 5000 × 10 cells were counted from the serial sections of the pituitary. The stain used was H. E. stain and the counts were done under a magnification of 900 with an eye-piece provided with an obturator.

TABLE 2

	Eosinophil	*Basophil*	*Chromophobe*
Normal (Group I)	31·3% ±1·4	11·4% ±1·3	57·3% ±4·7
Anoxic (Group II)	21·3% ±1·5	20·3% ±1·6	58·4% ±5·1
Anoxic (Group III)	30·2% ±3·2	19% ±2·1	49·8% ±5·2

Eosinophils of the blood were counted in six rats before and one hour after exposure. The results are as follows:

Rat. No.	*Eosinophil before exposure*	*Eosinophil after exposure*
4A	362	100
6A	470	0
16A	372	160
25E	388	96
35E	422	19
37E	410	46

DISCUSSION

Anoxia is a type of 'stressor' which affects all the cells of the organism and the changes described in some of the endocrines are but few links in the chain of reactions provoked by the 'stressor'.

The dissolution of the sudanophilic granules of the suprarenal cortex immediately after exposures accompanied by a fall in eosinophilic count of the blood indicate a discharge of oxysteroids in response to the stress. The pronounced increase in the basophilic cells of the anterior pituitary and the hyperplastic state of the suprarenal cortex in the stage of resistance indicates that the pituitary perhaps responds to the 'stress' by shifting its activity so as to maintain a high level of corticotrophin secretion. It is worthwhile to note that this increase in basophilic cells occurred at the expense of the acidophils, the chromophobes remaining unaltered. The hyperplasia of the suprarenal cortex was most obvious in the middle and inner zones, the zona glomerulosa being thinned out and the zona reticularis obliterated, giving rise to the impression that the cells of the middle zone in their proliferative propensity have partly replaced the cells of the other layers.

In the exhaustion stage the suprarenal cortex showed necrotic changes which in most cases were focal in distribution and more or less diffuse in character. In one case it was limited mostly to the middle zone. In another case the whole of suprarenal cortex was involved in coagulative necrosis. Disappearance of the sudanophilic granules from the suprarenal cortex has been noted in this stage and presented in the microphotograph.

Observations on suprarenal cortex in the present investigation are thus in agreement with those of other workers such as Sundstroem and Michaels (*loc. cit.*) Gordon *et al* (*loc. cit.*) and Altland (1948). Thorn *et al* (*loc. cit.*) and Gordon and his co-workers (*loc. cit.*) also noted great increase in thickness of the suprarenal cortex with proliferation of the cells of the zona reticularis of the rats repeatedly exposed to a simulated altitude of 27,000 ft. Apparently they did not follow up their experiments upto the stage of exhaustion.

Spectacular difference in result was seen between these rats and those of the third group which received 30 mg. of vitamin E injection (Evinol, 'Merck') daily in addition to anoxic exposure. Survival period of this group of rats was prolonged to 35±5 days as compared with 15±5 days in case of exposed rats of group II. Rats from both these groups were killed and examined by the 12th day. By this time the group II rats had lost much of their body weight and were either dead or moribund whereas the group III rats had increasing body weight and were vigorous. The suprarenal cortex of these rats receiving vitamin E injections were examined after 12th exposure. These rats were much more healthy than those not receiving this vitamin and showed hyperplasia of the cortical cells characteristic of the stage of resistance. The increased number of dark cells at the corticomedullary junction cannot be explained.

This observation shows that the health and vitality of an animal depend upon the integrity of the suprarenal cortex and that vitamin E preserves the integrity

of the suprarenal cortex of animals exposed to anoxia and thereby prolongs their survival period.

It is an open question whether this vitamin has got any direct action on the cortical cells or the anterior pituitary. It seems more reasonable to suppose that the beneficial effects of this vitamin may be due to its peripheral action on the tissues where it reduced the demand of the tissues for oxygen and thus ameliorated the anoxic stress and relieved the burden of the suprarenal cortex. The anti-oxidant property of vitamin E by virtue of which it reduces oxygen consumption of the tissues was first suggested by Bicknell and Prescot (1947). In a recent paper Rabinovitch and Boyer (1951) working on rat's heart concluded that this vitamin inhibits the succinic acid oxidase system by combining with cytochrome C. The beneficial effect of this vitamin on the structural integrity of the suprarenal cortex of rats exposed to anoxia is thus explained as being due to its oxygen sparing action.

Rate of growth in the second group of rats was remarkably retarded from the beginning and after a few exposures the body weight began to decline rather rapidly till by the 12th day they lost on an average about 13 per cent of their body weight. Such a failure of growth of rats exposed to anoxia have been observed by different workers. Selye (1950) postulates that during the stage of exhaustion catabolic impulses predominate over the anabolic. Thorn *et al* (*loc. cit.*) while being unable to attribute any specific reason for this loss of body weight concluded that any therapy likely to be useful in adaptation must be able to prevent the loss of weight.

In the third group of rats which has anoxic exposure combined with vitamin E injection all the rats showed increase in body weight within the period of observation amounting to 8 per cent on an average. The anorexia which was always present in the second group of rats and which must have materially contributed to loss of weight was absent in the vitamin E treated group.

It will be noted that the rate of growth in the group III animals exceeded even that of normal control. Various observers have noted that E avitaminosis is attended with failure of growth and the growth promoting action of vitamin E has been proved by Evans and Burr (1927) and by Blumberg (1935). It is worthwhile to note that the pituitary of rats receiving vitamin E did not show any diminution in acidophil count.

The testicular degeneration noted by us confirms in general the observation of other workers. Thus Gordon *et al* (1943) noted disintegration of spermatogenic elements of rats exposed to repeated anoxia which could not be prevented by administration of gonadotrophin. They concluded that degeneration of the seminiferous tubules was the direct effect of anoxia. The interstitial cells, though less affected by anoxia, could be maintained in normal condition by gonadotrophin. The same sort of degeneration of the spermatogenic elements and of the interstitial cells in anoxia were noted in the present investigation. Vitamin E while preserving the integrity of the interstitial cells had doubtful protective effect on the spermatogenic tissue.

Summary

(1) Histological changes in the pituitary, adrenal cortex and testes were noted in rats having exposure to a simulated altitude of 30,000 ft.

A record of the body weight is also presented.

(2) After the first few days the body weights of these rats declined and the suprarenal cortex showed signs of degeneration. There occurred increase in basophilic cells of the pituitary and degeneration of the spermatogenic elements of the testes.

(3) Vitamin E increased the survival period of these rats and could retard the fall in body weight and disintegration of the suprarenal cortex of animals exposed to anoxia of the same grade and duration as the second group. It had doubtful effects on testes under similar conditions.

Acknowledgments

The author expresses his grateful thanks to Dr. A. K. Dutta Gupta, Principal, Nilratan Sircar Medical College, Calcutta, for offering all facilities for this work. He also thanks Dr. P. K. Sen Gupta, Curator, Pathology Museum, for his assistance in examination of the histological structures and Sri Arun Dutta Gupta for technical assistance.

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EXPERIMENTAL STUDIES IN TROPICAL EOSINOPHILIA

(A Preliminary Report)

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AND

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Tropical eosinophilia is a clinical entity characterised chiefly by cough, paroxysms of dyspnoea, a raised total leucocyte count with persistent absolute eosinophilia and frequent systemic manifestations such as fever, lassitude and loss of weight. Though the syndrome has been recognised as a clinical entity for the last 15-20 years, there has been enough stumbling by even the wisest with regard to its suitable nomenclature. It has been variously described as pulmonary eosinophilosis (Viswanathan, 1948), tropical eosinophilia (Weingarten, 1943), pseudotuberculosis of the lung (Frimodt-Möller and Barton, 1940) and even Loeffler's syndrome (Apley and Grant, 1944) or eosinophilic leukaemia (Simeons, 1943).

Clinical and clinicopathological studies have also been made with ardour and enthusiasm with a view to establish the diagnostic criteria of the syndrome as also its possible aetiology. So far as the former, considerable amount of data have accumulated, but the criteria have not yet been established beyond criticism. Regarding the aetiology, some views have been forwarded, all of which await confirmation by adequate scientific evidences. In the absence of any post-mortem studies [except a single recorded case by Viswanathan (1948) which again was vitiated by the superadded picture of arsenic poisoning], the pathological lesions remain rather obscure. Recently, Menon (1946) had attempted to take up some experimental studies to produce eosinophilic condition in guineapigs by injecting blood of patients suffering from tropical eosinophilia. His work was based on one guineapig due to non-availability of fresh material for inoculation. Further, his work did not include any histopathological studies. Viswanathan, on clinical ground and Menon on this rather meagre experimental ground suggested the possibility of an infection to be aetiology of the syndrome. Recently Misra *et al* (1953) produced certain amount of eosinophilic response in monkeys and mice by injection of serum from patients of tropical eosinophilia which has been passed through Sietz filter. This work has been undertaken to find out whether this condition of eosinophilia can be produced in laboratory animals by material obtained from human patients suffering from the syndrome, and to study what histopathological lesion occurs thereinafter.

Method and Material

Selection of Patients from whom Materials for Inoculation were Taken:

This was based on (i) history; (ii) symptomatology; (iii) clinical signs; (iv) laboratory investigations (including radiological); (v) therapeutic considerations. The diagnostic data which form minimum criteria for selection of cases are shown in Appendix I.

Selection of Animals:

Healthy normal guineapigs were taken and isolated for 7 days. (The normal figures for total and differential count of the white cells were established earlier with 50 guineapigs—this included Kurloff bodies, taken as a separate type of white cell; the significance of these bodies ano their total rise form the subject of another paper (Sen and Tribedi) under publication.

Blood counts were made from the ear venules, every day to find any daily variation of total and differential count, specially the absolute count of eosinophils. Variations in the number of eosinophils in the guineapigs were studied and one such typical has been depicted graphically (Graph 1).

Three groups of animals were taken for experimental studies:

Group 1—Eight guineapigs selected with eosinophils varying from 0-500/c.mm. for inoculation purposes.

Group 2—Four guineapigs selected with eosinophils varying from 0-500/c.mm. for purposes of control inoculation.

Group 3—Four guineapigs with eosinophils varying from 0-500/c.mm. for purposes of blank control.

Group 1: 10-12 c.c. of blood was collected from the selected patients before treatment with strict aseptic precautions in a wide-mouthed glass tube containing requisite amount of double oxalate powder and centrifugalised lightly (300-500 r.p.m. for 4 minutes) retaining leucocytes to a certain extent in the plasma. 5 c.c. of plasma was collected. Before inoculation the animal was weighed and its blood count done.

The abdomen was shaved clean and sterilised very carefully. 5 c.c. of plasma was injected intraperitoneally.

Observations after inoculation—

1. Haematological: Blood count is made:
   (a) 4, 6, 12 and 24 hours after inoculation.
   (b) Daily for three days.
   (c) Weekly till one month.
   (d) Monthly till about 8-11 months.

The figure of the absolute eosinophil count was calculated from the total and differential counts and was considered in depicting graphic representations.

2. General Health and Sign of any Illness in the Animals: Animal was also observed for

TABLE I—SHOWING LEVEL OF EOSINOPHILS PER C.MM. OF BLOOD OF TWO OF THE EXPERIMENTED AND TWO CONTROL ANIMALS

			Before experiment	1 month			2 months	3 months	4 months	5 months	6 months	7 months	8 months	9-11 months	Maximum rise of eosinophils over the initial count
				1 Wk.	2 Wk.	3 Wk.	4 Wk.								
X	EXPERIMENTED Group 1 Patient's plasma inoculated	Guineapig (No. 3)	82 (1·0%)	500 (5·0%)	1020 (10%)	750 (8·1%)	700 (8%)	500 (5%)	400 (4·5%)	500 (4·5%)	1,050 (10%)	3,500 (20%)	5,400 (25%)	7,440 (30%)	7,300 (30%)	9,073%
Y		Guineapig (No. 6)	105 (1·5%)	1447 (15%)	1020 (10%)	574 (7%)	450 (6%)	3,250 (25%)	2,244 (22%)	2,970 (22%)	3,072 (24%)	3,148 (24%)	2,760 (23%)	2,814 (21%)	—	2,800%
I	CONTROL Group 2 Non-inoculated	Guineapig (No. C2)	100 (1·2%)	500 (5·4%)	850 (9·1%)	375 (5%)	75 (1·2%)	60 (0·9%)	100 (1·3%)	150 (1·8%)	110 (1·5%)	120 (1·6%)	100 (1·3%)	125 (1·6%)	—	850%
II	CONTROL Group 3 Normal plasma inoculated	Guineapig (No. C6)	150 (2%)	100 (1·8%)	75 (1·2%)	100 (2%)	150 (2·5%)	100 (2%)	200 (4%)	250 (3%)	75 (1%)	140 (4%)	250 (3·5%)	150 (2%)	—	166%

difference in weight, general health and any other signs of disease.

GROUP 2: *Material for inoculation*—Normal human subjects (selected from among the staff of the department) were selected. Special care was taken in selection to avoid any allergic or respiratory manifestations in these subjects. Blood was checked for eosinophilia for 3 consecutive weeks.

5 c.c. of plasma similarly collected was injected intraperitoneally in a similar way in the selected control group of animals. This group serves to indicate any eosinophilic response to human plasma *per se*.

Observation after inoculation—Similar findings were observed as in group 1.

GROUP 3: These animals were fed and maintained exactly in the same way as the other two. Their weight and blood counts were similarly checked. These were, however, not inoculated at all, and serve as normal control for haematological figures in a similar breed of animals.

NECROPSY AND HISTOPATHOLOGICAL STUDIES:

The animals were all killed after 8-11 months of observation (eosinophilia having reached a steady height by that time). A necropsy was performed noting any changes in the lungs, liver and other organs. Histopathological studies of the lungs only are recorded in the present communication. The two groups of control animals were also killed after the same period. The histopathological studies in group 2 serve to indicate whether there was any non-specific lesions after a single dose of normal human plasma; that in group 3 serves as an index to normal histology of guineapigs of the particular breed.

OBSERVATIONS AND RESULTS

GROUP 1:

1. *Haematological studies*—The leucocytosis and total eosinophilic counts were observed. There was leucocytosis with increase in eosinophils, both total and differential, within 1-2 weeks. There was a subsequent fall but usually much above the original level. The total leucocytes per cubic millimetre of blood also fell in the subsequent two weeks, but the absolute and differential counts of eosinophils were always at a higher level than the original figure. The variation in the hourly count of eosinophils after inoculation corresponds more or less to that of group 2. After about 1-3 months eosinophil count showed steady, persistent and progressive rise (Table 1 and Graph 1). This includes rise in both absolute and differential counts of eosinophils.

Thus the variation of eosinophils showed common tendency in all these eight animals. This included the following three phases (Graph 1).

(i) Initial rise—phase 1.
(ii) Subsequent fall—phase 2.

(iii) Secondary rise. This was progressive and finally reached a steady and sustained level—phase 3.

The period taken for developing the particular haematological phase and the level of the number of circulating eosinophils, varied to a certain extent. The above three phases have been represented conveniently in Table 2.

In two animals where there was considerable initial eosinophilia (500 per c.mm.) before inoculation the initial rise showed rather early commencement and was comparatively fairly high. The secondary rise also was rather early and attained a high peak (16,000 per c.mm.).

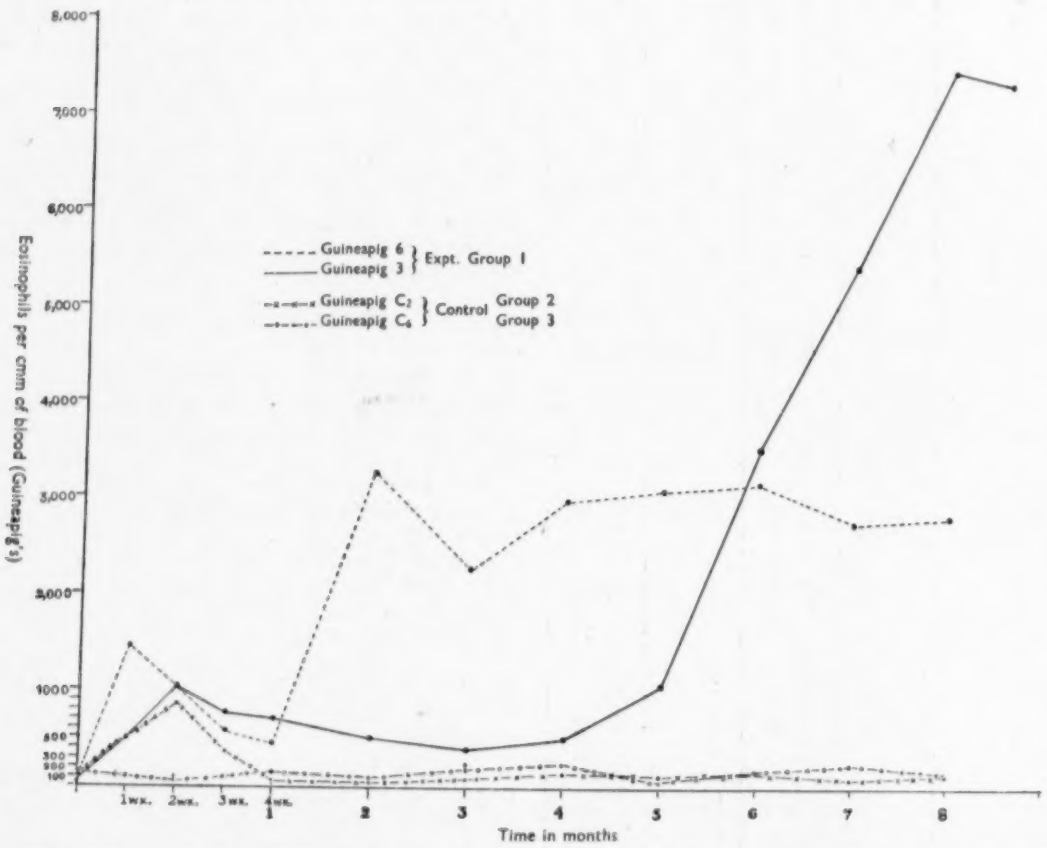
2. *Observation in general health and sign of any illness in the animals*—There is no significant finding with regard to the above.

GROUP 2:

Haematological studies—There was leucocytosis with slight eosinophilia in three of the four animals, within 2-14 days. This only varied from 400 cells per c.mm. to 800 cells per c.mm. (5-10 per cent). These came down to almost original level, and showed no further appreciable change during the period of observation. The eosinophil content of the blood of one of these three animals is shown in Table 1 and Graph 1. In the other animal, there was no appreciable increase worth mentioning.

TABLE 2—SHOWING PHASES IN EXPERIMENTAL PRODUCTION OF EOSINOPHILIA

Phase	*Haemato-logical Phase*	*Duration*	*Level of eosinophils per c.mm. of blood*	*Total rise during the whole period*
1.	Initial rise	1-2 weeks	400-1,500	600%-1,800%
2.	Subsequent fall	2-4 weeks	400-700	300%-500%
3.	Secondary rise	Commences after 1-3 months Peak at 4-8 months	2,00-16,000	1,800%-9,000%



GRAPH 1—SHOWING DIFFERENT PHASES IN THE RISE OF EOSINOPHILS IN TWO EXPERIMENTED AND TWO CONTROL GUINEAPIGS

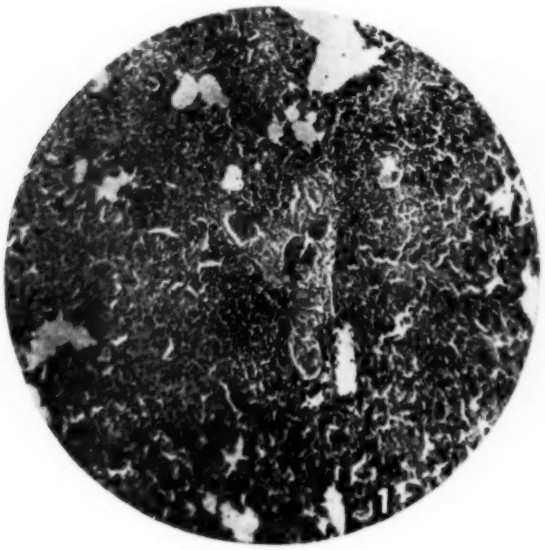


Fig. 1—Shows paravascular collection of eosinophils, lymphocytes and monocytes (H & E × 80).

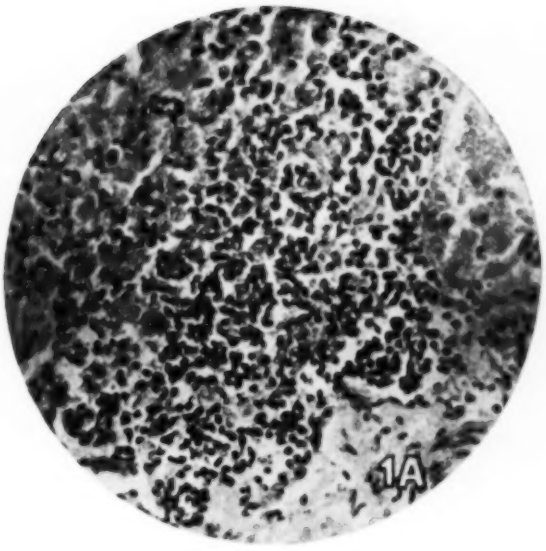


Fig. 1A—High power magnification of the same specimen as in Fig. 1 shows lymphocytes, fair number of eosinophils and monocytes in relation to a vessel (H & E × 176).

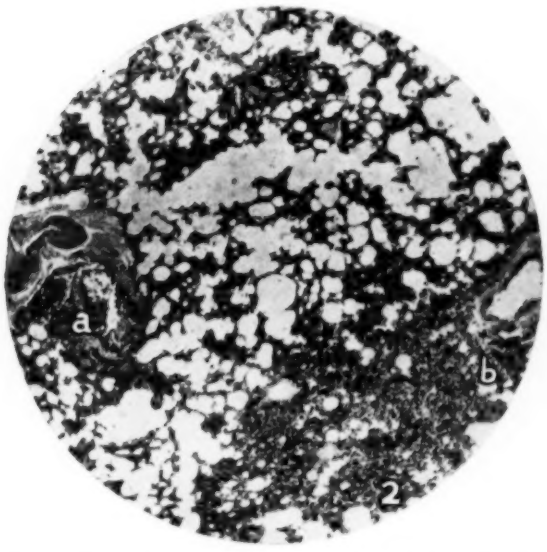


Fig. 2—Showing (a) a bronchiole—with cellular collection inside the lumen as also in the musculature. There is also parabronchiolar infiltration of cells; (b) A patchy broncho-pneumonic consolidation involving a large number of alveoli—this is in relation with a vessel (H & E × 80).

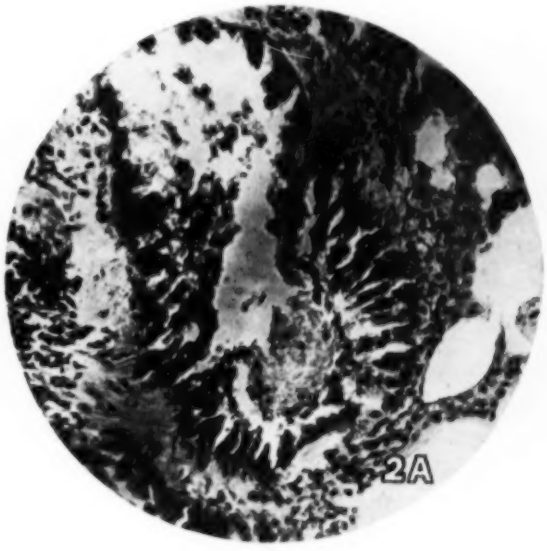


Fig. 2A—High power magnification of the area (a) of Fig. 2 showing (i) denudation and disintegration of bronchiolar epithelium, (ii) clumps of eosinophils in the lumen, (iii) disintegration of bronchiolar musculature and infiltration with eosinophils and round cells. In addition there is parabronchiolar infiltration of round cells (H & E × 176).

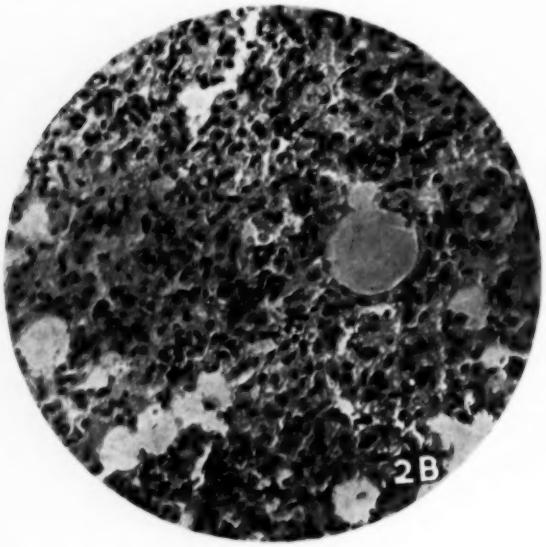


Fig. 2B.—High power magnification of area (b) of Fig. 2. The area of patchy consolidation involves several alveoli and their walls. The cellular infiltration consists predominantly of eosinophils. The other cells are of lymphocytic and monocytic types (H & E × 176).

Fig. 3—Showing normal lung pattern of the guineapig (taken from Control group 3). Note scanty cellular collections which are sometimes normally present (H & E × 89).

SEN AND TRIBEDI — *Experimental Studies in Tropical Eosinophilia (pp. 432-36)*

Fig. 1

Fig. 2

MISRA — *Chloroma (pp. 442-43)*

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GROUP 3:

Haematological studies—The eosinophil content of this group showed slight irregular fluctuations, sometimes rising to a considerable height, but never persistent. The content of eosinophils of one such animal is shown in Table 1 and Graph 1.

General health and sign of any disease are of no significance.

NECROPSY AND HISTOPATHOLOGICAL STUDIES: For the present, observations in the lesions in the lungs only are recorded. A detail study of liver, spleen, lymph glands and bone marrow is being made.

Group 1—Lungs: The naked eye appearance revealed that the lungs were congested to a certain extent with small whitish patches slightly paler than surrounding tissues, in line with the surface. These patches were more prominently seen in the cut surfaces.

There were localised congested points simulating almost haemorrhagic areas, but no haemorrhage could be detected. The patches were not necrotic and sometimes presented appearance of consolidation.

Microscopic picture—In 6 guineapigs the following three types of lesion could be differentiated:

(i) Parabronchiolar and paravascular infiltration of lymphocytes and eosinophils (Figs. 1 and 1A, *vide* Plate).

(ii) Bronchiolitis and parabronchiolitis (Figs. 2 and 2A, *vide* Plate). There was denudation of epithelium, disintegration of bronchiolar wall and infiltration of the muscuiature by large number of eosinophils; there were also clumps of eosinophils filling up the lumen and also around the bronchioles. In addition there was also parabronchiolar infiltration of round cells.

(iii) Bronchopneumonic patches (Figs. 2 and 2B, *vide* Plate) involving several alveoli—the predominant cells being eosinophils; a few round cells formed part of cellular infiltration. The distribution of these patches appeared to be somewhat related to bronchioles and/or a vessel.

In the other two, rather scantier type of lesion was found. This consisted of

(1) Parabronchiolar and paravascular infiltration of lymphocytes. Eosinophils were scanty.

(2) There were occasional eosinophils in the alveolar wall, with congestion of blood vessels inside them.

(3) No definite sign of bronchiolitis or parabronchiolitis seen.

CONTROL GROUPS 2 AND 3

Lungs—No definite macroscopic or microscopic lesions were noted. Fig. 3 (*vide* Plate) shows one obtained from an animal of group 3.

DISCUSSION

The intraperitoneal injection of a single dose of plasma of patients suffering from tropical eosinophilia has been observed to produce progressive eosinophilia in guineapigs. Artificial production of eosinophilia with different antigens has been reported by several workers. Max Samter (1949) produced artificial eosinophilia to the extent of 400 per cent—1400 per cent by using plasma, horse serum, etc., in repeated doses. Biggart (1932) produced eosinophilia of 0-700 per cent by using horse serum, egg albumin, plasma, serum or fibrin, but observed for a few weeks only. Vaughn (1952) produced eosinophilia in guineapigs by antigen derived from Ascaris serum.

All these workers used repeated doses of the antigen thus bringing in the process of hypersensitiveness in developing the eosinophilia. In case of Vaughn the material used was injected in a single dose which brought about only transient eosinophilia. None of them appear to have reported persistent and high eosinophilia with a single dose of the material they used.

In the present work a single dose of plasma of patients suffering from tropical eosinophilia has been enough to produce fairly high and sustained eosinophilia. This production of eosinophilia does not, therefore, appear to be related to an allergic process. On the other hand, it transpires that the blood of patients suffering from tropical eosinophilia possibly contains an agent which by itself can induce fairly high degree of sustained eosinophilia in guineapigs. The presence of this eosinophilogenic agent in the blood of patients might be the same as the one which has produced eosinophilia in themselves. As to the nature of this unknown agent, it is not possible for us to predict any further, at present.

The control group 2 eliminates still further the possibility of any non-specific stimulus of human plasma to produce the eosinophilia in the animals. The capacity of a single dose of normal plasma to produce some degree of leucocytosis and eosinophilia may be compared with that derived from patients. The eosinophilia produced in group 1 is much more pronounced and sustained. On the other hand, the eosinophilia produced in the control group 2 is comparatively slight and transient; this may be due to a non-specific stimulus of a foreign protein introduced in the animals.

Control group 3 is included to eliminate any spontaneous steady rise of eosinophils in similarly maintained animals.

It may be noted that in our series, one of the criteria for selection of cases has been a positive W.R. with a negative Kahn test. We have tried to eliminate syphilis by history, other clinical findings and a negative Kahn reaction in absence of treatment for the latter. It has been pointed out by Gupta (1945), Menon (1946), D'Abrera and Stork (1946), Viswanathan (1948) and others that in fair number of cases, W. R. is positive with a negative Kahn test. Menon, Viswanathan and others have suggested that in doubtful cases where differential diagnosis lies between tropical eosinophilia and asthma or any allergic condi-

tion with eosinophilia, this criterion of positive W. R. with a negative Kahn test is of considerable help in diagnosis. The combination of positive W. R. with a negative Kahn test, thus constitutes an additional point in selection of cases. Subsequently, however, plasma of patients otherwise diagnosed as tropical eosinophilia with negative W. R. and Kahn have also been used for similar experiments with almost similar results. Comprehensive evaluation of Wassermann reaction and other control experiments are not described here, and form subject of a separate paper.

Summary

1. Plasma from eight cases of tropical eosinophilia was injected in eight healthy guineapigs with normal eosinophil count.

2. There was a rise of eosinophil content of blood of all the eight animals.

3. The eosinophilia thus produced was progressive and persistent during 4-8 months' observation.

4. Definite histopathological lesions were observed in the lungs.

5. It may be suggested that the blood of patients suffering from tropical eosinophilia contains certain agent which can give rise to progressive eosinophilia with changes in the lungs in guipeapigs.

Acknowledgment

We are grateful to Dr. D. C. Chakravorty, Principal and Superintendent Medical College and Hospitals, for kindly permitting collection of materials from the Out-patients Department and to Dr. M. Chettri, M.D., the Resident Physician of the hospitals, for his kind co-operation Our heartfelt thanks are also due to Prof. S. N. De of N. R. Sarkar Medical College, Calcutta, for his helpful criticism and suggestions.

APPENDIX I

CRITERIA FOR SELECTION OF CASES

In the selection of cases, symptomatology, clinical signs, laboratory investigations and therapeutic response have been taken into consideration.

Symptoms:

The following symptoms have been considered:

(i) Cough.
(ii) Respiratory difficulty.
(iii) Low intermittent fever.
(iv) Lassitude and weakness.
(v) Disturbed sleep either in the early or later part of the night.
(vi) Absence of history of asthma or any allied allergic manifestations.
(vii) Absence of history or clinical manifestation of syphilis and any treatment for the latter.

Signs:

The presence of vesicular breathing with prolonged expiration and/or rhonchi—are always present in selected cases.

Laboratory Investigations:

High leucocytosis—15,000/c.mm. and above.
Percentage of eosinophils—40 per cent and above.
Total eosinophils—Above 6,000/c.mm,
E. S. R.—40 mm. per hour and above (Westergren).
W. R.—Positive (3/10 to 10/10) with Kahn negative.
Tuberculin test—Negative cases preferred. 1 in 100,000 positive cases are not selected.
Skiagram—Positive cases are only selected.
Sputum—A. F. B. negative and eosinophil positive cases are selected.
Stool—Ova, specially of *A. lumbricoides* and hookworm are looked for (three successive examinations including concentration method); negative cases are only selected.

Therapeutic Response:

This provides another criterion in the present series. Inoculation is made before treatment is started and follow-up of the cases during the course of therapy showed response to organic arsenicals.

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THE PLACE OF INTRAVENOUS IRON ADMINISTRATION IN COMBATING ANAEMIA DURING DEEP X-RAY THERAPY

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The presence of anaemia in patients suffering from malignant disease is rather important to a radiotherapist, because it precludes proper radiotherapy. The difficulty is further enhanced by the fact that, during irradiation treatment, the anæmia, which is generally present in modorate or severe degree in association with the malignant disease, is aggravated by radiation therapy.

Whereas blood transfusion is reserved for severe and urgent cases which need hospitalisation, the majo-

rity of patients having radiation treatment as outpatients, have to be treated by oral administration of iron, in one form or the other, for their anæmia. It was a common experience that iron therapy by the oral route failed to check the steady downward trend of hæmoglobin concentration in any appreciable extent, especially, in cases who received large field radiation therapy e.g., for carcinoma breast or carcinoma cervix and carcinoma œsophagus and for reticulosis; in many such cases, treatment had to be discontinued temporarily or, sometimes, permanently, because of progressive anæmia, resulting in complete disruption of the treatment, plan and dosage schedule.

Finding the encouraging reports of intravenous iron therapy by saccharated iron oxide in the treatment of iron deficiency anæmia in association with various clinical conditions, as reported by Nissim (1947), Davidson and Girdwood (1948), Slack and Wilkinson (1948 and 1949), French (1948), Govan and Scott (1949), Hawkins, Peeney and Cooke (1950), Sinclair and Duthie (1949 and 1950), it was decided to explore the possibility of utilising intravenous iron therapy in combating anæmia in radiotherapeutic practice—in view of the fact that anæmia due to malignant disease and that due to radiation therapy was of hypochromic type.

It was our usual practice to have an initial blood examination done of all cases referred for deep x-ray therapy; subsequent blood examination, at weekly or fortnightly interval, was done in cases which were treated by multiple large fields and in whom there was possibility of development of anæmia during the course or radiation therapy.

So far as hæmoglobin concentration was concerned, it was the usual practice to consider 60 per cent (Hellige) as the minimum safe limit; below that level, x-ray treatment was discontinued. Cases which showed that their haemoglobin was near about 60 per cent to start with, were not taken up for x-ray therapy until anti-anaemic treatment raised it to 75 to 80 per cent.

The effect of intravenous iron therapy was studied in the following lines:—

(1) To take up for x-ray therapy cases with initially low haemoglobin (between 55 and 60 per cent); and to start intravenous iron therapy and x-ray therapy in full doses simultaneously and see the effect on the blood picture.

(2) To allow the hæmoglobin concentration to fall down considerably (in cases with initially more than 70 per cent) during the course of x-ray therapy and then start intravenous iron therapy along with the x-ray treatment without any modification of the plan.

(3) The third category were those cases who had a fair blood picture to start with (hæmoblogin above 70 p.c.) but were sure to develop anæmia during the course of x-ray therapy; they were given x-ray treatment along with intravenous iron and were closely watched.

At the outset, it may be pointed out that almost all the cases were treated as outpatients and most of them were of the low income group. Apprehending the danger of sudden unexpected complications or late reactions occurring in the patients' homes and taking into consideration the necessity of prolonged administration of the drug, it was decided to administer either 2·5 c.c. of saccharated iron oxide* (containing 50 mg. of elemental iron) mixed with 25 c.c. glucose (25 per cent daily), or 5 c.c. of it (containing 100 mg. of elemental iron) on alternate days. The injections were given in the x-ray department by house staff, and 50 cases were treated by intravenous iron therapy for the purpose of the investigation.

Results

The results of treatment are given in Table 1. 28 cases are recorded and 22 left out because serial blood examination was not done in these cases.

Analysis of Results

In group I, in which haemoglobin per cent was initially low (between 55 and 65) and x-ray treatment was started along with intravenous iron therapy, it was found that in 7 out of 11 cases x-ray treatment could be successfully completed with the help of the treatment. In 4 cases the treatment did not materially help and rapid decline of Hb. per cent compelled us either to abandon x-ray therapy altogether or stop it temporarily for giving blood transfusion. Of these 4 cases, two were cases of retroperitoneal sarcoma, one of testicular seminoma with enlarged abdominal glands and one was a case of œsophageal carcinoma with extreme dysphagia.

In group II, in which intravenous iron therapy was resorted to only when Hb. per cent was on the decline, this treatment was useful in 4 out of 5 cases. In one case, x-ray treatment had to be stopped and blood transfusion resorted to in order to combat anæmia—which could not be controlled by intravenous iron; and this was a case of œsophageal carcinoma with extreme dysphagia.

In group III, in which Hb. per cent was initially fairly high (i.e. 70 or above) and intravenous iron therapy was resorted to from the beginning in order to maintain the Hb. at a high level during x-ray therapy using large fields, all cases were successfully tackled without any interruption of the treatment plan and/or modification of it; in none of these cases, Hb. per cent went down to 60, the lowest limit. Cases in all groups, which showed stationary Hb. per cent during x-ray and intravenous iron treatment, and cases, which showed decline of Hb. per cent in group III, were probably due to low dosage of iron in comparison to requirements.

*Intravenous Iron (Iviron) prepared by British Schering.

TABLE I—RESULTS OF TREATMENT.

	Hb.% raised during treatment	Hb.% static during treatment	Hb.% declined during treatment	Total
Group I				
Hb.% initially low. X-ray treatment started along with intravenous iron	6	1	4*	11
Group II				
Hb. initially above 70%. Intravenous iron started when Hb.% fell down after a few x-ray exposures	2	2	1*	5
Group III				
Hb. initially higher—70% and above. X-ray treatment given along with intravenous iron	6	3	3	12
TOTAL.				28 Cases.

* X-ray treatment had to be abandoned or temporarily stopped for giving blood transfusion.

One interesting point noted was that, in cases of oesophageal carcinoma with extreme degree of obstruction, intravenous iron therapy could not control progressive anæmia during radiation therapy; while in patients with œsophageal carcinoma, who could swallow or had gastrostomy done prior to deep x-ray therapy, intravenous iron therapy was effective in controlling anæmia during radiation therapy, no matter whatever group they belonged to prior to commencement of treatment.

COMPLICATIONS

Complications of intravenous iron therapy were very few in our hands—2 cases had rigor and high rise of temperature following injections and one case showed thrombophlebitis in the vein injected; otherwise no other untoward symptoms occurred.

Injections were given very slowly at the rate of 2 to 3 cc. per minute. This indicates that administration of the drug in the outpatients' department is pretty safe, provided the injection is given very slowly and in moderate dosage.

CASE REPORTS

Case 1—Sm. Ashalata Paul, H.F., 30 years. Case No. 991.

Carcinoma cervix—Radiotherapy to the parametrium after radium treatment to the cervix.

Deep x-ray therapy given to parametrium by 4 fields, 2 anterior and 2 posterior, 15 × 15 cm² each. Two fields were treated a day; six such treatments per week.

X-ray treatment started on 13-2-51. Fersolate 1 tab. t.d.p.c. and Becadex 1 tab. t.d.p.c. prescribed from the start.

Blood examination report on 29-1-51—Hb.—64%, R.B.C.—3.31 million/c.mm., W.B.C.—7900/c.mm.

On 23-2-51 after 8 deep x-ray sittings, blood showed the following: Hb—60%, R.B.C.—3·3 million/c.mm. W.B.C.—7400/c.mm.

Hb per cent was falling, in spite of oral iron therapy and had come to the lowest safe limit.

Intravenous iron therapy was, therefore, prescribed and injections started from 27-2-51. 2.5c.c. of Iviron with glucose was administered daily; 5 such injections given between 27-2-51 and 3-3-51.

Blood report on 5-3-51—Hb—72%. R.B.C.—3·35 million /c.mm. W.B.C.—5200/c.mm.

Deep x-ray treatment being continued in the meanwhile. 5 more injections of Iviron (2.5 c.c. each) were given from 6-3-51 to 10-3-51.

Blood report on 12-3-51—Hb—82%. = 11 g./100 c.c. of blood. R.B.C.—4.12 million/c.mm. W.B.C.—7000/c.mm.

Deep x-ray treatment completed on 14-3-51 giving a dose of 3500r/4 weeks' time, to the parametrium without any trouble or complication.

Remarks—Steady improvement in the blood condition helped the completion of deep x-ray therapy without interruption. Without the help of intravenous iron therapy, treatment would have to be stopped.

Case 2—Paritosh Bala Dasi, H. F., 52 years. Case No. 1416.

Carcinoma cervix—irradiation of parametrium after radium treatment to the cervix.

Deep x-ray therapy with 4 fields, 15 × 13 cm² each, two anterior and two posterior. Two fields were treated a day with 200r (in air) to each field. Prescribed dose, 3100r/4 weeks' time to the parametrium.

Treatment started on 17-3-52.

Blood report on 21-3-52—R.B.C.—2.99 million/c.mm. W.B.C.—7·400/c.mm. M.C.V.—96$c\mu$ M.C.H.—28$\gamma\gamma$ M.C. H.C.—29%.

Treatment with Iviron started on 22-3-52. 5 c.c. of the drug with 25 c.c. of glucose given on alternate days—6 such injections given in 13 days time from 22-3-52 to 3-4-52. Deep x-ray treatment withheld from 30-3-52 to 2-4-52 for diarrhœa.

Blood examination on 8-4-52—Hb—60%. R.B.C.—3·13 million/c.mm. W.B.C.—2500/c.mm. M.C.V.—87$c\mu$. M.C.H. —27 $\gamma\gamma$. M.C.H.C.—31%.

Treatment continued and 3 more Iviron 5 c.c. each given on alternate days between 14-4-52 and 18-4-52. Deep x-ray treatment completed on 19-4-52.

Blood count on 21-4-52—Hb—65%. R.B.C.—3.13 million/c.mm. W.B.C.—4400/c.mm. M.C.V.—87 $c\mu$. M.C.H. —29 $\gamma\gamma$. M.C.H.C.—33%.

Remarks—Response to Iviron therapy was not very satisfactory; however, it maintained the hæmoglobin level, more or less, steady.

Possibly, dosage of iron higher than that given, might have been helpful.

Deep x-ray treatment was, of course, continued according to plan.

Case 3—Mrs. Charubala Dassi, H.F., 35 years. Case No. 1086.

Scirrhous carcinoma left breast—for post-operative radiotherapy.

Deep x-ray therapy to 4 fields, each 15 × 15 cm², two tangential chest fields and two axillary and supraclavicular fields. One tangential field and one supraclavicular field treated a day. Treatment started on 11-6-51. Six treatments were given per week.

Becadex—1 tab. t.d.p.c.

Fersolate—1 tab. t.d.p.c. prescribed from the start.

On 14-6-51 preliminary blood picture was as follows—Hb—75% R.B.C.—3.30 million/c.mm. W.B.C.—7,600/ c.mm.

On 20-6-51 i.e. after 7 sittings of deep x-ray treatment—Hb—50%. R.B.C.—2.78 million/c.mm. W.B.C.—7,200/ c.mm.

Intravenous iron therapy started on 22-6-51.

2·5 c.c. Iviron with (25%) 25 c.c. glucose given, intravenously, on 22nd, 23rd, 25th, 28th and 30th June, 1951.

Blood examination on 30-6-51—Hb—85%. R.B.C.—4.53 million/c.mm. W.B.C.—6500/c.mm. M.C.V.—88.8 $c\mu$. M.C.H.—27 $\gamma\gamma$. M.C.H.C.—29·7%.

Deep x-ray therapy was continued without any interruption and modification.

Finding good response and, in the absence of any intolerance to the drug, Iviron 2.5 c.c. was injected on 2nd, 3rd, 4th, 5th and 9th July along with glucose; deep x-ray therapy continued.

Blood report on 9-7-51—Hb—78%. R.B.C.—4.02 million /c.mm. W.B.C.—8200/c.mm. M.C.V.—90 $c\mu$. M.C.H.—27·2 $\gamma\gamma$. M.C.H.C.—28·6%.

Treatment to chest wall and supraclavicular region ended on 11-7-51.

Remarks—Intravenous iron therapy positively helped in carrying out the wide field irradiation for carcinoma breast in this case; without it, rapidly developing anæmia would have prevented and modified x-ray treatment plan.

It increased hæmoglobin percentage and also R.B.C. count.

Dose given to chest wall—3672r/4 weeks.

" " axillary and supraclavicular region—3708r/4 weeks.

Case 4—Mr. Debendra N. Ghosh, H. M., 60 years. Case No. 1247.

Retroperitoneal sarcoma in the abdomen.

Deep x-ray therapy was started on 29-10-51. Entire abdominal cavity from xiphisternum to symphysis pubis was irradiated by open anterior and posterior fields. Area of each fied was 682 sq. cm.; a dose of 50r (air) per field was prescribed. One field was treated a day.

Blood examination on 30-10-51 showed—Hb—72% R.B.C.—4·31 million/c.mm. W.B.C.—8200/c.mm.

After 14 treatments blood examination done on 15-11-51 showed—Hb—65% R.B.C.—4·38 million/c.mm. W.B.C.—7800/c.mm. M.C.V.—74 $c\mu$. M.C.H.—21$\gamma\gamma$. M.C.H.C.—28%.

Iviron was prescribed and injections were started from 19-11-51. 2·5 c.c. of the drug given daily with glucose.

Altogether 11 injections were given from 19-11-51 to 1-12-51.

Meanwhile, x-ray dosage per treatment was doubled i.e., 100r (air) was given daily from 19-11-51 to 29-11-51. On 30-11-51 the field size was reduced to 310 sq. cm. and daily dose increased to 200r (air) per day.

Blood examination on 3-12-51 showed—Hb—62% =8·6 g./100 cc. of blood. R.B.C.—4·43 million/c.mm. W.B.C.—6900/c.mm. M.C.V—73 $c\mu$ MC.H.—20$\gamma\gamma$. M.C.H.C.—27%.

On 7-12-51 patient started complaining of nausea and vomiting. 4 injections of 2·5 c.c. Iviron were given from 10-12-51 to 13-12-51.

Blood examination on 13-12-51 showed—Hb—65% R.B.C.—4·75 million/c.mm. W.B.C.—5900/c.mm. M.C.V.—72$c\mu$. M.C.H.—10·4$\gamma\gamma$ M.C.H.C.—27%

The second course of Iviron controlled nausea and vomiting. Treatment was completed on 13-12-51.

Remarks—In this case, there was not much improvement in the blood picture but considering the extent of the field and dosage it can be said that Iviron had prevented the haemoglobin from falling below 60 per cent. It is our usual practice to stop radiation treatment when Hb is persistently below 60 per cent.

Possibly higher dose of iron might have helped to raise the Hb per cent to a still higher level. Total tumour dose =2700r/7 weeks' time.

Case 5—A. C. Boral, H. M., 34 years. Case No. 1111.

Inoperable adenocarcinoma of right kidney.

Deep x-ray therapy was given by three fields e.g., anterior, lateral and posterior—each 15 × 15 cm² in size. One field was treated a day with 250r (air); six treatments per week. Prescribed tumour dose was 4400r/5 weeks' time.

Becadex and Fersolate 1 tab. each t.d.p.c. prescribed from the start.

Treatment started on 5-7-51.

Blood examination on 4-7-51 showed—Hb—65% R.B.C. —3·7 million/c.mm. W.B.C.—5600/c.mm.

On 14-7-51—after 7 treatments of deep x-ray therapy, patient complained of severe weakness, nausea, vomiting. Blood examination done and Pyridoxin was advised.

Blood report on 14-7-51 showed—Hb—78% R.B.C.—3·7 million/c.mm. W.B.C.—4100/c.mm. M.C.V.—97·5cμ. M.C.H.—29γγ. M.C.H.C.—30·5%.

Treatment was continued for 5 more days; weakness increased, nausea was present but somewhat less. To maintain a steady blood picture during the period of x-ray treatment, Iviron, was administered—5 × 2·5 c.c. between 20-7-51 and 29-7-51. Oral administration of iron was stopped.

Constitutional improvement was definite and blood examination on 30-7-51 showed—Hb—85%. R.B.C.—4·25 million/c.mm. W.B.C.—3800/c.mm. M.C.V.—93cμ. M.C.H.—28·3γγ. M.C.H.C.—30%.

Further x-ray treatment was well tolerated without any further trouble—and absence of nausea; treatment was completed on 10-8-51 according to plan.

Remarks—Weakness and nausea relieved and blood picture improved progressively.

Case 6—Nanibala Dasi, H. F., 43 years. Case No. 1223.

Carcinoma breast—postoperative radiation therapy.

Deep x-ray therapy started on 3-10-51.

Two tangential fields to the chest wall and two fields to the axillary and supraclavicular region 15 × 15 cm² each. Prescribed dosage 3500r to the chest wall and 3900r to the centre of the axilla in little over 4 weeks. Two fields were treated daily: six sittings per week.

Fersolate and Becadex 1 tab. t.d.p.c. advised from the start.

12-10-51—Patient feeling weak and having nausea. Blood examination on 12-10-51—Hb.—70% R.B.C.—4·47 million/c.mm. W.B.C.—7100/c.mm. M.C.V.—88 cμ. M.C.H.—22γγ M.C.H.C.—25%.

Iviron prescribed—5 injections of 2·5 c.c. each, given on alternate days between 14-10-51—22-10-51 in order to stabilise the haemoglobin percentage at a higher level.

Blood examination on 27-10-51 showed—Hb—82%. =11·4g./100 c.c. R.B.C.—4·9 million/c.mm. W.B.C.—5600/c.mm. M.C.V—82cμ. M.C.H.—27γγ. M.C.H.C.—31%.

Patient felt better, weakness disappeared and nausea subsided.

Deep x-ray treatment was continued till the rest of the dose was given and was ended on 5-11-51. Full prescribed dose was given.

Remarks—Iviron greatly improved blood picture and also relieved nausea and weakness during treatment.

Case 7—Golam Kader Mondal, M. M., 30 years. Case No. 1448.

Adenocarcinoma ascending colon. Postoperative radiotherapy after hemicolectomy and intestinal anastomosis.

Deep x-ray therapy was started on 14-4-52, right half of the abdominal cavity treated by two 15 × 15 cm² fields, anterior and posterior, and a dose of 400r/5 weeks to the centre of the abdominal cavity was prescribed.

Blood examination on 16-4-52—Hb—75%. =10·5g./100c.c. R.B.C.—4·67 million/c.mm. W.B.C.—6400/c.mm. M.C.V—72cμ. M.C.H.—23γγ. M.C.H.C.—32%.

Apprehending development of anaemia due to radiation, Iviron was prescribed, and 5c.c. of the drug given on 17th, 22nd, 24th, 28th, 30th April, and 2nd, 5th, 8th, 12th May (total 9 injections of 5 c.c. each).

Blood count on 13-5-52—Hb—75% =10·5 g./100 c.c. R.B.C.—4·03 million/c.mm. W.B.C.—3700/c.mm. M.C.V.—95cμ. M.C.H.—26γγ. M.C.H.C.—30%.

The course of deep x-ray therapy was uneventful and prescribed dosage was given without any modification and treatment was completed on 20-5-52.

Remarks—Development of anaemia due to radiation prevented—helping us to deliver full prescribed dosage.

Case 8—Kadambini Debi, H. F., 58 years. Case No. 1263.

Carcinoma right breast—postoperative radiotherapy.

Deep x-ray treatment started on 9-11-51 with 15 × 15 cm² to the chest wall tangentially, and to supraclavicular region. 2 fields were treated daily; 6 treatments per week.

Blood examination, immediately before treatment, on 8-11-51—Hb—75% =10·5 g./100 c.c. R.B.C.—4·27 million/c.mm. W.B.C.—8500/c.mm. M.C.V.—88cμ. M.C.H.—25γγ. M.C.H.C.—30%.

On 15-11-51 patient started complaining of nausea, weakness and lassitude. Iviron prescribed—2·5 c.c. of the drug mixed with glucose given I.V. on 17th, 18th, 19th, 20th, 21st Nov. 1951. This resulted in considerable diminution of nausea and weakness and patent could stand radiation well. Lack of supply interrupted iron therapy; it was again given on 27th, 28th, 29th, 30th Nov. and 1st Dec., 1951 in the same dosage, as above. Nausea slightly present, slight weakness.

Blood examination on 5-12-51—Hb—75% =10·5g./100 c.c. R.B.C.—4·37 million/c.mm. W.B.C.—5400/c.mm. M.C.V.—81cμ. M.C.H—24γγ. M.C.H.C.—30%.

7-12-51—Weakness and lack of appetite progressively increasing.

Iviron 5 c.c. given on 7th, 9th and 11th December, 1951.

Deep x-ray treatment completed on 12-12-51. Total dose given to chest wall—3750r/4 weeks. To axilla—3400r/4 weeks. On that day nausea and vomiting was practically absent but weakness present.

Blood examination on 13-12-51—Hb—70% =9·8g./100 c.c. R.B.C.—3·81 million/c.mm. W.B.C.—6300/c.mm. M.C.V.—94·6cμ. M.C.H.—26γγ. M.C.H.C.—28%.

Remarks—Development of progressive anaemia checked and Hb per cent was more or less maintained at a steady level during the entire course of deep x-ray therapy.

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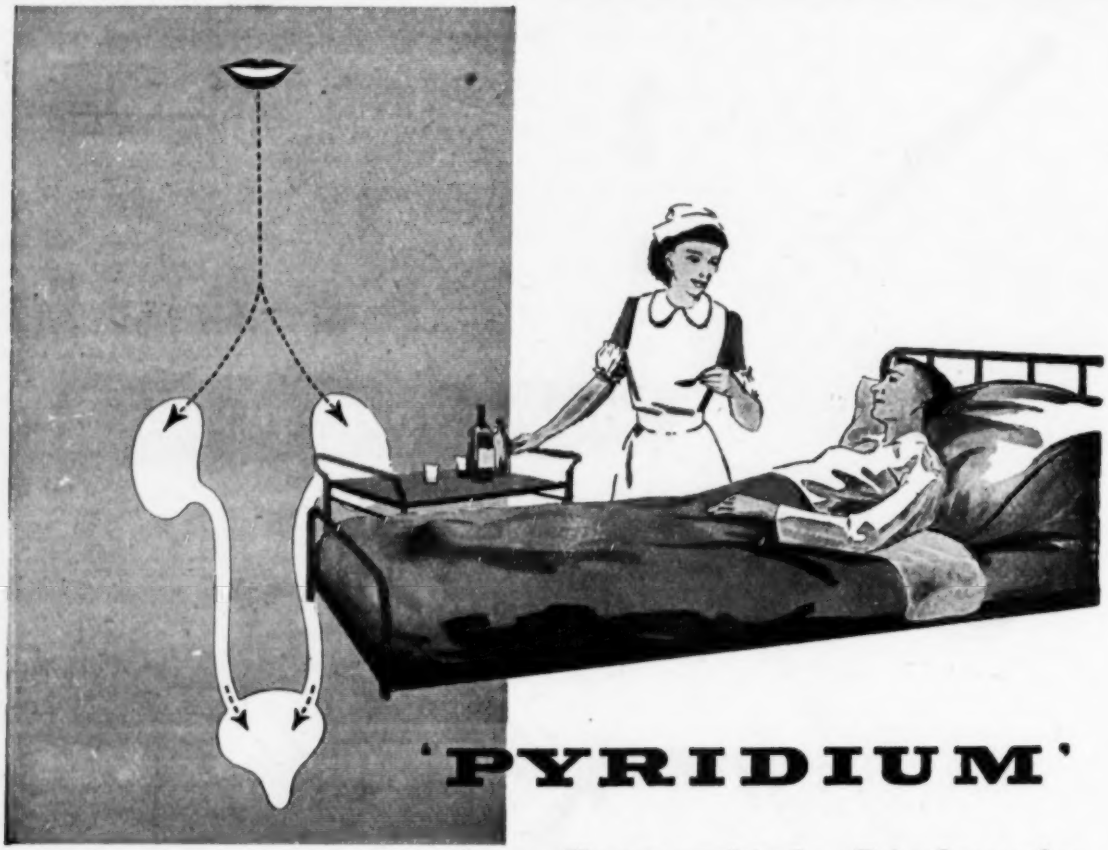

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Nausea and vomiting were relieved with intravenous iron therapy.

Case 9—Sabejan, M. F., 36 years. Case No. 1450.

Radical mastectomy done for carcinoma left breast and sent for postoperative radiotherapy.

Treatment plan—20 × 18 cm^2 field, lateral and medial to the chest wall, tangentially; 15 × 12 $cm.^2$ field to anterior and posterior supraclavicular and the axillary region; and a small field to include the sternoclavicular and jugular fossa region.

All the fields were divided in two groups: A. for chest wall; B. for drainage area; each group treated thrice weekly.

Treatment started on 9-4-52 and six treatments were given per week.

Blood picture on 3-4-52— Hb—76% =10·6g./100 c.c. R.B.C.—4·39 million/c.mm. W.B.C.—7000/c.mm. M.C.V.—76·5μ M.C.H.—25$\gamma\gamma$. M.C.H.C.—32%.

On 11-4-52 i.e. after two treatments, patient started complaining of weakness and loss of appetite and slight nausea.

Intravenous iron therapy was prescribed with 2·5 c.c. of Iviron on alternate days to prevent the development of anaemia due to radiation.

This dose was given on 12th, 14th, 16th, 19th, 21st, 25th, 28th, 30th April and 2nd and 5th May 1952—interruption due to lack of supply. Deep x-ray treatment completed on 8-5-52 without any ntrouble.

Blood examination on 7-5-22 showed—Hb—85% =11·9g./100 c.c. of blood. R.B.C.—5 million/c.mm. W.B.C.— 4800/c.mm. M.C.V.—84cμ. M.C.H.—24$\gamma\gamma$. M.C.H.C.—29%.

Total dose given—to chest wall—3450r/4 weeks; to axillary and supraclavicular region—3760r/4 weeks' time to jugular notch field—3328r/4 weeks' time.

Remarks—Iviron therapy enabled us to continue the treatment uninterruptedly and without any ill-effect. It was successful in maintaining a fair blood picture even up to the end of the deep x-ray therapy and to relieve nausea and weakness.

Summary and Conclusion

Effect of intravenous iron therapy in twenty-eight patients suffering from malignant disease of different types and sent for deep x-ray therapy—were studied.

Intravenous iron therapy has proved to be of definite value in checking development of progressive anaemia or improving the blood picture of an anaemic patient during radiation therapy; with its help, successful administration of deep x-ray therapy has been achieved without any modification of plan or break in the radiation treatment schedule.

Previous experience has shown that only with iron administration by the oral route, to combat anaemia, many cases which were undergoing wide-field irradiation could not have their treatment completed because of rapidly developing anaemia.

Routine blood examination studies show that most of the patients suffering from malignant disease have hypochromic microcytic anaemia and that anaemia developing during radiation therapy is also of the same type; as such, iron therapy is very well indicated. Occasional macrocytosis was observed; but, in view of low colour index and low mean corpuscular haemoglobin concentration, iron therapy was given along with liver extract.

In some cases, there was rapid disappearance of nausea and vomiting with intravenous iron therapy; and, in majority of cases, weakness and lassitude, which are so common complaints during wide field deep x-ray therapy, improved considerably.

It was also observed that the R.B.C. count increased along with rise of Hb per cent as a result of intravenous iron therapy given during radiation treatment.

During intravenous iron therapy, blood examination should be done regularly every week and, depending on the nature of the response, the dose of elemental iron be adjusted.

In desperately anaemic cases to start with, it is better to improve blood condition by a transfusion before commencing radiation treatment; the same holds good when, after 5 injections of saccharated iron oxide each containing 50 mg. of elemental iron, Hb per cent shows no sign of elevation or even goes down.

In cases of oesophageal carcinoma with marked obstruction to the passage, intravenous iron therapy was of little or no help.

Complications of this form of treatment were negligible and a few that occurred were not very serious in the present series; probably frequent administration in low dosage and at a very slow rate were important factors in preventing complications.

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CHLOROMA

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Chloroma is a rapidly developing malignant neoplasm involving the haemopoietic tissues, of unknown aetiology and fatal termination, usually associated with a leukaemic blood picture, typically of the myelogenous type (Duke-Elder, 1952). It has been variantly described by haematologists (Whitby and Britton, 1950) as a rare type of acute leukaemia associated in its most characteristic form with greenish coloured tumours. In whatever way it is interpreted the disease is most protean in its nature with characteristic tumours, leukaemic blood picture and ending fatally in course of a few weeks or months.

HISTORY: Since its original description by Burns (1821) who noted the green orbital tumours with fatal outcome, chloroma has been extensively described in the literature and has been reviewed by various authors, the foremost among them being Brannan (1926) who collected 135 cases, Washburn (1930) who brought the total number of cases to 162 and later to 197 and Edgerton (1947) who annotated 336 cases.

The name chloroma was given by King (1853) who described a typical case in a young girl and the association of green tumours with leukaemia was suspected by Von Recklinghausen (1885) and was established by Dock and Warthin (1904).

At first it was considered to be of lymphoid origin but in recent years it has been shown that the vast majority of cases are of myelogenous nature (Washburn, 1930).

ÆTIOLOGY—The disease appears in apparently healthy children up to 12 years of age, males are more affected than females in the ratio 2:1. It occasionally occurs in adults and when it does, it usually affects them after the fourth decade but may occur at all ages. A congenital case has been described (Morrison *et al*, 1939, quoted by Whitby and Britton, 1953).

PATHOLOGY—The tumours are most commonly found beneath the periosteum of the orbit where they give rise to exophthalmos without involving the eyeball. Other sites are temporal bones, sternum, ribs, vertebrae and pelvic bones. They may be found in tissues other than bone—the breast, kidney, muscle and liver may be affected. Brannan (1926) states that no organ or tissues is exempt except perhaps the brain and spinal medulla. The spinal meninges may be affected and a tumour may cause a pressure paraplegia. Usually the green colour of the tumour rapidly fades on exposure to air. The nature of the pigment has been little studied but it is said to be protoporphyrin which has been found also in glands from ordinary myeloid leukaemia (Dustin and Thomas, 1938, quoted by Whitby and Britton, 1953). Some authors consider the pigment to be of lipoid origin (Chiari, 1883; Malkin, 1925).

Pathologically, the essential change is a primary hyperplasia of the bone-marrow which produces masses of primitive white cells beneath the periosteum usually of immature myeloid appearance. The tumour so formed is composed of accumulation of such cells held together by a fine reticular stroma.

CLINICAL FEATURES: *Symptoms*—Symmetrical proptosis or unilateral proptosis with marked anaemia in a child is highly suspicious of the case to be one of chloroma. In addition, weakness, haemorrhage and purpura may be found. Mouth lesions and wasting are common. The spleen and glands are usually enlarged. Multiple tumours may appear over the skull, the temporal bones become swollen, producing the facies chloromatosa (frog's face). Patches of green pigmentation mark swellings in the skin. Tumours may appear over the sternum and throughout the entire skeleton; blindness and deafness may occur. Death occurs in a few months from disturbance of metabolism, exhaustion, cerebral or myelitic symptoms, septicaemia or pneumonia or haemorrhage from various organs.

Blood Changes—Blood picture is similar to that found in acute leukaemia and is indistinguishable from acute myeloblastic leukaemia. The count of leucocytes varies from 14,000 to 20,000 per cmm. but is sometimes within normal limitts. Leucopenia is rare (Ashby and Sellers, 1923, quoted by Whitby and Britton, 1953). The leucocytic changes are associated with severe anaemia, anisocytosis, poikilocytosis and signs of red cell regeneration.

DIAGNOSIS—The main features described under blood and systemic changes are quite distinguishing in the diagnosis of the condition. Other orbital tumours from haemopoietic diseases like myeloma, plasmocytoma and reticulosis have to be differentiated. The rarer tumours of the eye of nervous, epithelial, vascular, muscular, mesenchymal and of developmental origin have to be considered in the differential diagnosis.

PROGNOSIS AND TREATMENT: The disease is invariably fatal in a few weeks to a few months. No treatment is of any avail. Radiation has been tried and may ameliorate local symptoms and pain but does not affect the general disease. Arsenicals and blood transfusion have proved of little value. Surgical excision of the tumour should only be reserved for biopsy for diagnostic purpose.

One case of chloroma came under the observation and treatment of the authors in S. C. B. Medical College Hospital in 1953 which presented certain interesting features in addition to usual descriptions.

Case Report

B. B., aged 7 years was admitted into hospital on 17-1-53 with complaints of proptosis of 15 days' duration, discharge from both ears of one month standing and irregular fever since 15 days. Prior to these complaints the relatives noticed the gradual pallor the child had been developing for a few days past. Protrusion of the eye-ball which they noticed developed rather rapidly. This particularly alarmed them and admission into hospital was sought.

On examination (18-1-53) the child was found extremely anaemic with marked proptosis of both the eye balls, the proptosis being more marked on the left. Gums were hypertrophic with bleeding points. Glands—cervical, axillary and inguinal were enlarged and palpable. Symmetrical swelling of about half an inch diameter each were marked on both temporal regions of the skull. The tumours were hard to feel, they were tense and rather shining with veins prominent over them. The child in decubitus was in a drowzy and apathetic state and had vomiting almost after every feed. Pulse was rapid—120 per minute, regular with low volume and tension and the temperature was 101·2°F.

Abdomen—The spleen was palpable one finger below the costal margin, the liver was not enlarged and no lumps or glands were felt.

Heart—Haemic murmurs were audible in all the areas of the heart being most marked in the pulmonary region and near the midline of the sternum, otherwise the heart sounds were normal.

Lungs—A few crepitations at the base were detected, else the breath sounds were vesicular in character.

Nervous system—Nothing abnormal detected.

The ears were discharging thick pus with signs of suppurative otitis media.

Eyes—Both eyes were proptosed, the left being noticably more than the right, the lids over the proptosed eye-balls were tense, shiny and the veins were prominent over them. The conjunctivae were chemosed and had a few blood vessels prominent over them. (Figs. 1 and 2, *vide* Plate). Visual acuity—The patient could count fingers at more than two meters, pupils equal and central and reaction to light and accommodation were normal. Ophthalmoscopic examination of the fundus showed tortuous and congested veins and blurred disc margins.

Laboratory Tests:

Urine—Specific gravity was 1022, reaction acid; abnormal constituents were nil and the reaction to test for Bence Jones protein was negative.

Blood—The blood picture is tabulated as follows:

Table 1—Showing Analysis of the Blood Picture

Dates	*Total R.B.C./ million c.mm.*	*Total W.B.C./ c.mm.*	*Poly per cent*	*Lympho per cent*	*Mono per cent*	*Myelocytes per cent*	*Myeloblasts per cent*
18-1-53	2·37	6,000	30	44	1	25	nil
22-1-53	—	7,400	27	35	1	32	5
26-1-53	—	—	18	56	1	15	10
5-2-53	2·2	10,000	37	20	1	30	12

W.R.—Negative.

Biopsy—From a puncture of one of the tumours and of the temporal regions showed blast cells (probably of myeloid origin) held in a stroma of fine reticulum.

Subsequently the child developed proptosis more and more. Corneal ulcers were formed with prolapse of the iris. Two other tumours were noticed on the cranium symmetrically on both frontal bones at the middle (27-1-53). Vomiting became incessant with increased drowziness. Blood was noticed in the stools and there was oozing of blood from the gums and eyes (28-1-53).

The relatives were upset and got rather desperate at the gradual deterioration of the health of the child and removed him from the hospital at their own risk on 5-2-53.

The child was readmitted almost in a dying state on 4-3-53 with bleeding from the gums, the eyes and the rectum. The eye-balls were almost out of the orbital cavities and both the eyes developed panophthalmitis. Two additional tumours were found symmetrically on both sides over the occipital bone. The child was semicomatose and the temperature was high (104°F.) and he died on 5-3-53 at 5 p.m. Autopsy could not be conducted, as the relatives did not allow the same.

Discussion

The age of the patient, the blood picture, the tumours and the fatal end—all testify to the fact that the child was a case of chloroma. The drowziness suggests the affection of meninges and the suppurative otitis media suggests the affection of the internal ears. The interesting feature was the symmetrical disposition of the tumours. The leucocytic count continued to remain within normal limits, which is a rare feature in the condition.

Summary

The literature on chloroma is reviewed.
A case is reported.
Some interesting features are discussed.

Acknowledgment

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III

THE CURRENT STATUS OF CARDIOVASCULAR SURGERY

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The successful obliteration of a patent ductus arteriosus on August 26, 1938 by Dr. Robert E. Gross in Boston, Massachusetts inaugurated an era of tremendous progress in cardiovascular surgery. Increasing knowledge of the physiology of the cardiovascular system and of anesthesiology has contributed to the advances in diagnosis and in techniques of anesthesia and surgery. The expanding availability of the antibiotics, improved understanding of the problems of blood and fluid loss, and better facilities for the restoration of homeostatic equilibrium have made operations possible that could hardly have been undertaken when this surge of activity was started a short fifteen years ago.

Basic Concepts

1. Origin of Defects:

Congenital cardiac defects follow specific patterns since they represent an alteration in the normal growth and development of the heart in its change from an initial tubular structure to a complex pump. The configuration of the heart is usually established by the eighth week of intra-uterine life. Anomalies are due to arrests of developmental processes, persistence of intra-uterine structures into post-natal life, or to maldevelopments during the process of septation, of vascularization, and of venous return.

In intra-uterine life the lungs do not function and the heart is adapted to minimizing the pulmonary blood flow by patency of the ductus arteriosus and foramen ovale which allow most of the blood to pass from right heart and pulmonary artery into the left heart and aorta without going through the lungs. The function of the lung is taken on by the placenta. However, at birth there is immediate need for establishment of a pulmonary exchange of oxygen and carbon dioxide so that with establishment of respiration the direction of flow in the ductus is reversed and blood flow through it ceases. The associated rise in pressure in the left auricle favors closure of the foramen ovale. These factors constitute the transition of the normally developed heart from the intra-uterine to the post-natal state.

2. Cyanosis:

In congenital heart disease cyanosis is an indication of a marked abnormality. It is due to the presence of at least 5 grams per cent of reduced hemoglobin in the circulating blood and in many cases is directly attributable to a large shunting of venous (unoxygenated) blood directly into the peripheral circulation. Abnormalities in the pulmonary circulation of significance in this regard are the inadequacy of blood flow to the lungs, impaired oxygenation of what blood flow there is, or failure of return of oxygenated blood to the systemic circulation. Lack of oxygenated blood leads to polycythemia and anoxemia. The occurrence of cerebral thrombi in association with the former is of great clinical significance in congenital heart disease. There is often an associated retardation of growth.

3. Special Diagnostic Procedures:

Cardiovascular surgery is performed, for the most part, in medical centers where the talents of the various hospital services can be coordinated to the optimum degree. The basic appraisal of each patient must include a thorough history and physical examination; cardiac fluoroscopy and roentgenographic study (including films made after a barium swallow in the postero-anterior and both oblique projections); electrocardiography; measurements of blood pressure, venous pressure, and circulation time; and analyses of the urine and blood, including the erythrocyte sedimentation rate. The information available by angiocardiography, aortography, ballistocardiography, and cardiac catheterization may be essential in some of the cases of congenital and acquired lesions before a valid decision concerning surgery can be made.

Cardiac catheterization consists of inserting a special catheter into the right auricle *via* an antecubital vein. Under fluoroscopic guidance the catheter is manipulated into the right ventricle and pulmonary artery and out into the pulmonary capillaries. Occasionally the catheter may pass onto sites other than the right side of the circulation by adventitiously going through septal defects of anomalies of venous return. During its residence in the heart, pressures, graphic tracings, measurement of oxygen and carbon dioxide saturations, and x-rays are obtained at various levels. From this information the site, extent and direction of shunts can be recognized, and calculations of systemic, pulmonary, and shunt blood flows are made. Catheterization is not without some risk. It should be carried out in cases in which septal defects and obstruction to the pulmonary outflow tract are suspected. Catheterization has particularly great value in defining obscure cardiac anomalies.

Angiocardiography is performed by injecting a dye rapidly into one of the large antecubital veins and taking a series of roentgen films in rapid succession. By this means an exact visualization of the dye is obtained as it courses through the cardiac chambers and major vessels. This procedure sequentially outlines the cardiac chambers and course of blood flow. It demonstrates abnormalities of the great vessels, differentiates the position of mediastinal masses and offers a clue to the thickness of the ventricular walls,

as well as to overriding vessels, and to shunts, chamber position, and size.

The tendency to eliminate some of these procedures in doubtful cases, under the guise of saving time or economy, can only be deplored. Patients who are explored and found to have conditions that cannot be improved by surgery usually do badly during or after operation. A maximum of information preoperatively offers the greatest opportunity of reducing the number of these unrewarding explorations to a minimum. On the other hand, the majority of the clear classical cases of patent ductus arteriosus, coarctation of the aorta, "pure" mitral stenosis with marked pulmonary hypertension, and others may reasonably be offered surgery without resorting to these special techniques.

A cardiovascular surgical conference, or other device for obtaining a joint consultation type of opinion, in which cardiologists, radiologists, physiologists and surgeons collaborate and air their views freely, is often provocative of discussion that is of real value in deciding the place of surgery for each case.

4. Classification of Surgical Procedures:

Many surgical procedures have been proposed during the comparatively short period of time since it was first demonstrated that these lesions need not be considered beyond the surgeon's domain. For the sake of convenience, one may consider separately the operations for congenital and for acquired cardiovascular problems. Within each category will be presented, first, the operations that have attained general acceptance as standard surgical procedures; secondly, procedures that are still best considered to be in the experimental phase.

The management of aortic aneurysms, peripheral vascular problems, thromboendarterectomy, arteriovenous fistulae, essential hypertension, and the surgical treatment of portal hypertension have been considered as falling beyond the scope of this review.

5. Operating Room:

It is recognized that the role of the *anesthesiologist* during all this work is of paramount importance. As in all open chest surgery, general anesthesia, employing a minimum number of agents, and with controlled respiration and intratracheal intubation, are employed.

An electrocardiographic record during operation, and the presence in the operating room of a cardiologist to interpret and help correct early changes in cardiac rhythm or rate, are advisable. An electric defibrillation is essential to manage the possible complication of ventricular fibrillation. Other apparatus, including an oximeter, pressure manometers, and facilities for the measurement of blood loss and the rapid replacement of blood, are also desirable. All this implies a concentration of coordinated activity greatly in excess of that required during other types of surgery.

6. Post-Operative Care:

Close observation during the immediate and early postoperative periods are indispensable. This is best conducted in a Recovery Suite, located in continuity with the operating rooms. Such a suite, staffed by a special crew of nurses specifically trained in the detection and management of complications in the postoperative cardiac patients, should be completely equipped with oxygen and suction at each bed, as well as sufficient basic equipment to be a self-sustaining unit. An obstructed airway leading to various degrees of pulmonary collapse, intrathoracic bleeding (verified by drainage through the intercostal tube, connected to a water-seal system, and left indwelling for at least twenty-four hours), and shock are the early problems. Particularly following mitral valvular surgery, a considerable increase in the digitalis need often appears during the first five days after operation, with tachycardia, arrhythmia, and cardiac decompensation. Prompt correction of these and other changes may be life-saving.

7. Prognosis:

When the patient is ready to be discharged from the hospital, what is his outlook? It must be emphasized that most of these operations are palliative rather than curative. True, this palliation may be extraordinary in degree, with rehabilitation of cyanotic children and adult invalids with mitral stenosis to an extent where they may lead normal lives. They do not have normal hearts, however. Increasing the flow of blood to the lungs improves the prognosis but does nothing about the other lesions for a child with a Tetralogy of Fallot. Opening the stenotic mitral valve in a rheumatic cardiac will increase the cardiac output and lessen the pulmonary hypertension, but cannot restore the integrity of the diseased myocardium or the changes in the pulmonary parenchyma.

These people must continue under the care and supervision of the cardiologist for the rest of their lives. Many will continue to require digitalis and diuretics as well as restrictions in diet and activity, all less in degree than preoperatively, but no less important. These do not indicate operative failure, but must be recognized as limitations of the procedures. Patients with a patent ductus arteriosus, coarctation of the aorta, or vascular ring can be cured; some of the most recent operations for isolated pulmonic stenosis and for auricular septal defects may eventuate in cures; most of the remaining procedures must be considered as life-saving or palliative.

Congenital Cardiovascular Defects

A. Definitive Procedures:

1. *Patent Ductus Arteriosus*—Normally this shunt between the pulmonary artery and the aorta, which diverts the flow of blood away from the lungs during intra-uterine life, closes spontaneously within a few

weeks after birth of the infant. Failure of closure to occur results in a persisting arteriovenous fistula. In the majority of instances the dynamic complications of such a fistula lead to an increased blood volume and eventually to cardiac failure. Other complications include infection, with the development of subacute bacterial endarteritis, aneurysmal dilatation, and pulmonary hypertension.

The diagnosis can usually be made on standard clinical and radiological grounds. These patients are not cyanotic unless there is reversal of blood flow from pulmonary to aortic side in the ductus, or congestive heart failure. The presence of a machinery type of to-and-fro murmur and thrill over the second interspace to the left of the sternum also audible in the back, substantiated by a wide pulse pressure, a prominent pulmonary artery segment, and pulmonary vascular congestion are indicative of the lesion, although these signs may be caused by a defect in the septum between the first portions of the aorta and pulmonary artery. In dubious cases cardiac catheterization and/or angiography may yield valuable information.

Operation, aimed at effective closure of the ductus, is usually performed after the third year of life, and the majority of reported cases have come to surgery during the first decade. Infants that are doing badly require surgical intervention earlier, and at the other end of the scale adults in the fifties may be operated on. Complete division of the ductus is advocated by Gross, Potts, and others; many centers prefer the Blalock obliteration technique, employing multiple suture ligatures. The latter would appear to be less hazardous, and equally effective when properly performed. The presence of active infection in the ductus, as manifested by fever and positive blood cultures, is an indication for specific antibacterial therapy to sterilize the lesion, followed within a few weeks by operation. If antibiotic or chemotherapy are ineffective, the operation should not be deferred, and may succeed in eliminating the infection as well as the shunt.

Because of the probability of a shortened life span or cardiac invalidism, all children and young adults with a patent ductus should be operated upon even in the absence of symptoms. Well over 2500 cases of patent ductus arteriosus have been operated on in this country, with an overall surgical mortality of about 5 per cent, falling to below 3 per cent in a few of the larger clinics.

2. *Aortic-Pulmonary Fistula*—As indicated above, this lesion may be indistinguishable from a patent ductus arteriosus, except on exploration of the chest. Whereas the latter is usually remarkably constant in location (communicating with the aorta a short distance distal to the origin of the left subclavian artery), the aortic-pulmonary fistula between the first portions of the aorta and pulmonary artery may be situated at a variable distance from the base of the heart. A few such lesions, well beyond the coronary ostia, have been successfully obliterated. Exploration is indicated in any case since the defect represents a left to right shunt.

3. *Coarctation of the Aorta*—The presence of a segment of marked narrowing of the thoracic aorta, at times amounting to complete obstruction, is one of the few causes of systemic hypertension in children. The finding of elevated blood pressures in the arms, lower or absent pressures in the legs, and absent femoral pulsations suggest the diagnosis. Rib notching, usually seen on the roentgenogram of the chest, is a manifestation of the extensive collateral circulation in the chest wall. Symptoms, when present, are usually those of hypertension. The hypertensive sequelae, including cardiac hypertrophy and decompensation, cerebral hemorrhage, and rupture of the aorta, as well as infection, account for the fact that only 25 per cent of these untreated patients survive beyond the fortieth year.

Angiocardiography or aortography, while not mandatory, may aid in disclosing an atypical location or the extent of the lesions. Classically these are situated in the customary location of the insertion of the obliterated ductus arteriosus (patent in about 10 per cent of coarctations). Instances of operable stenoses lower in the thoracic aorta have been reported. When the coarctation is of the so-called "infantile" type, involving the aortic arch in the region of the origins of the great vessels, surgical relief is generally not possible at the present time.

Resection of the coarcted segment with direct suture anastomosis of the divided ends of the aorta, as developed by Crafoord and by Gross, is the operation of choice. Anastomosis of the left subclavian artery to the lower aortic segment has proven to be less satisfactory. When the stenotic vessel is too long to permit the first procedure, preserved homologous aortic grafts have been successfully used to bridge the gap. Blood vessel banks have been established to make segments of vessel available for such contingencies, and the methods of preservation include tissue-culture solutions, freezing, cathode-ray irradiation, and others.

Elimination of the coarctation results in a lowering of the blood pressure and restoration of pulses in the legs. The optimum age for operation is in the second decade; the early occurrence of sclerotic changes in the aorta makes the operation more hazardous in older individuals. Associated cardiac and valvular defects constitute additional contraindications to surgery. The overall operative mortality is in the range of 5 to 8 per cent.

4. *Vascular Rings*—Gross was the first to demonstrate that the syndrome of "dysphagia Luroria" could be treated surgically. The syndrome of partial or complete compression of the esophagus and the trachea is caused by an engulfing vascular ring. This may be a double aortic arch, abberant right subclavian artery arising retroesophageally from the thoracic aorta, anomalous left common carotid artery, anomalous innomi-

nate artery, or a right aortic arch with a left ligamentum Botalli. The surgical treatment consists essentially of division and separation of the lesser of the engulfing arches. These infants are studied preoperatively by contrast visualization of the trachea and esophagus. Complete obstruction may be impending and early operation life-saving.

5. *Pulmonic Stenosis*—Pulmonary stenosis impedes the flow of blood into the lungs. Stenosis of the pulmonary valve, as an isolated lesion or in association with an interauricular septal defect, must be distinguished from other types of cyanotic heart disease. Cardiac catheterization is of real value in establishing the degree of elevation of right ventricular pressure in this condition, in which right sided cardiac enlargement and strain often precede the onset of fatigue or cyanosis. In those instances where the catheter can be pulled back from the poststenotically dilated pulmonary artery into the right ventricle, the exact site of constriction may occasionally be demonstrated. The diagnosis is made by the presence of a murmur, x-ray, and cardiac catheterization findings.

Symptoms vary with the degree of block to the pulmonary outflow tract. The presence of markedly increased right ventricular pressure is an indication for operation because when cardiac failure appears the downhill course is usually rapidly progressive. Patients with few symptoms, and minimal impediment to pulmonary blood flow, and only slightly elevated right ventricular pressure, who tolerated the anomaly well, need not be operated upon.

Pulmonary valvulotomy by way of the right ventricle, as developed by Brock, has been most satisfactory in relieving the obstruction, without the creation of an additional defect. Operative mortality varies from 5 to 20 per cent. Valvulotomy under direct vision in a bloodless field is currently being explored by others as a possible means for a more definitive procedure.

6. *Diverticulum of the Ventricle*—Although this is an extremely rare cardiac anomaly, Skapinker and Potts each have reported a case with a surgical cure. In each instance the diverticulum presented as a pulsating mass in the epigastrium, and was resected, restoring the heart to normal.

7. *Pulmonary Arteriovenous Fistula*—Cyanosis without heart disease may suggest the presence of this lesion; confirmatory evidence may be obtained by angiocardiography. The fistulae are congenital and may be familiar. Hemoptysis is frequently present. A murmur may sometimes be heard over the lungs. Because these lesions are often multiple, treatment should consist of excision with preservation of as much pulmonary parenchyma as possible.

B. PALLIATIVE PROCEDURES:

1. *Tetralogy of Fallot*—The lesions contributing to this syndrome consist in the main of obstruction to the flow of blood through the pulmonary artery, right ventricular hypertrophy, an overriding aorta, and an interventricular septal defect, in varying degrees and in combination with other anomalies. In contrast to pure pulmonary stenosis, the obstruction in the tetralogy frequently lies in the infundibulum below the pulmonic valve and may present as a partial shelf or diaphragm. The pulmonary artery and its branches are usually smaller than normal. The basic problem is the lack of an adequate flow of blood through the lungs, and this deficit is manifested by cyanosis and hypoxia throughout the body, all aggravated by exertion or intercurrent illness, and usually culminating in death at an early age. Average duration of life in Abbott's series was twelve years. These children are cyanotic and exhibit clubbing of the fingers and toes. Polycythemia and right axis deviation are usual. Angiocardiography reveals an enlarged right ventricle, a right to left shunt, and early opacification of the ascending aorta because of the overriding. The pulmonary fields show decreased vascularization. On cardiac catheterization the catheter may pass from the right ventricle through the septal defect or into the overriding aorta.

The fundamental conribution of Taussig and Blalock has been the development of a technique for ameliorating this situation by creating an anastomosis between the systemic and the pulmonary arterial circulations—in other words, an artificial patent ductus arteriosus. This may be effected by the use of the subclavian artery or another branch of the aorta (Blalock), or by the Potts modification in which a side-to-side anastomosis is made between the pulmonary artery and the aorta. Direct pulmonary valvulotomy is feasible in the small number of cases in which a valvular obstruction exists. Subvalvular and infundibular resections have been less satisfactory and more hazardous. When operation can be deferred beyond the third year of life, the surgical mortality rate is reduced to about 6 per cent. A mortality of 12 to 20 per cent is entailed in the operations necessitated at younger ages, due to the deteriorating status of the infants.

Tetralogy patients who have symptoms should be offered surgical intervention, avoiding operation until at least the age of three and preferably waiting until ages four to fourteen. Although the operation is not curative and surgical results are unpredictable, many of these children are greatly benefited. Best results are to be anticipated when the aortic overriding is minimal. It is important to differentiate the tetralogy from Eisenmenger's complex which is discussed under "Experimental Procedures".

2. *Tricuspid Atresia*—The infants with this condition tend to be sicker earlier, and carry a poorer prognosis than the preceding group. The basic lesion preventing an adequate flow of blood to the lungs is the obstruction at the tricuspid orifice. Extra-uterine survival is impossible without an interauricular septal

defect. There may be an associated right ventricular hypoplasia. The electrocardiogram shows a left ventricular preponderance, in contrast to the tetralogy. Creation of an artificial ductus again affords palliation and relief of cyanosis, but the long term outlook is less favourable than with the tetralogy. Particularly in the smaller infants, the Potts procedure may be technically less difficult to perform than the Blalock type of anastomosis.

3. *Transposition of the Pulmonary Veins*—When all the pulmonary veins enter into the right auricle, or vena cava, life is impossible without the presence of an interauricular septal defect. Partial correction of the situation may be obtained by reimplanting the anomalous pulmonary veins into the left auricle. Cardiac catheterization is essential in analysing such a problem. In the isolated instances where only the left pulmonary veins enter the right auricle, their reimplantation into the left auricle could achieve a definitive result. The creation of an adequate interauricular septal defect permits oxygenated blood to pass into the left heart in those instances where all the pulmonary veins drain into the right side.

C. Experimental Procedures:

Some of these operations have been tried and found wanting; others are showing early promise of success, but have not yet been afforded an adequate trial.

1. *Interauricular Septal Defects*—These and interventricular septal defects can be diagnosed with certainty by a combination of clinical signs, angiocardiography, and cardiac catheterization. While many of these lesions are not incompatible with a normal life expectancy, cardiac strain in some emphasizes the need for adequate correction. Earlier clinical attemps to achieve this have included the passage of strips of suture material over the defect (Murray); invaginating the tips of one or both auricular appendages into the defect (Swan); plastic buttons or discs (Hufnagel); and invagination of the right atrial wall into the defect (Bailey). Currently these and other methods of closure are receiving careful scrutiny. Gross has succeeded in suturing a rubber well to the right auricle, opening the auricle inside the well, and suturing the defect by working within the well. Lewis and Bailey each have succeeded in opening the right auricle and suturing the defect while the vena cavae were temporarily occluded, under conditions of artificial refrigeration. The bloodless field afforded by the artificial heart is under study. Shumacker has proposed a means of sewing a pocket of pericardium into the opening. There is considerable promise that an acceptable solution to this problem may be at hand with some of these techniques.

2. *Intraventricular Septal Defects*—There is no adequate method for the treatment of this lesion at the present time. Tubed pericardial flaps and strips of living sutures have been tried and have failed. Low and small ventricular defects are benign and well tolerated and require no treatment.

3. *Transposition of the Great Vessels*—When the aorta arises from the right ventricle and the pulmonary artery from the left ventricle, survival can only occur if a septal defect is present in addition. Three types of procedures are being performed to correct this situation, with indifferent success for the most part. Blalock has created additional auricular septal defects plus a systemic-pulmonary arterial anastomosis, with a mortality of about 50 per cent. Bailey and Ripstein have each divided the aorta and pulmonary artery and reimplanted them, without success. Lillehei and Muller each have attempted dividing and reimplanting the pulmonary veins and vena cavae into the opposite auricles, in stages; this work is still in the developmental stage.

4. *Eisenmenger's Complex*—In this situation all of the features of the tetralogy of Fallot are present, with the exception of pulmonary valvular obstruction. The pulmonary artery is large, and may be huge. Cyanosis may be absent, or late in appearing. Among the theories advanced for the pulmonary insufficiency has been the concept of arteriolar obstruction within the lung parenchyma. One possible means of improving this has been attempted by Muller, in narrowing the size of the main pulmonary artery. It is too soon adequately to evaluate this procedure. In this condition, of course, the anastomotic procedures used for the tetralogy can have no beneficial effect and in fact would be disastrous.

5. *Ectopia Cordis*—Numerous unsuccessful attempts have been made to provide a temporary covering for the heart located outside the thoracic cage in the living infant. Distortion of the major arteries and veins connected with the heart has largely been responsible for early death in all recorded cases.

6. *Artificial Heart*—While this is still in the experimental stage, it is of paramount importance to the solution of many of the problems in both the congenital and acquired cardiac defects. Clinical application to date has been largely disappointing, for the most part due to technical problems. These "artificial hearts" have been of two distinct types. Some have been devised to take over the function of both lungs and heart. Others have been devised to replace the pump action of the heart using the intact lungs for oxygenation of the circulatory blood. The possibility of working within the bloodless heart, while an artificial heart takes over the needs of the body temporarily, promises to be one of the major areas of progress in this field. As a tool for basic physiologic investigation, it has permitted fundamental observations to be made on the mechanism of valvular function, by high speed photography, as well as on other aspects as cardiac and circulatory dynamics.

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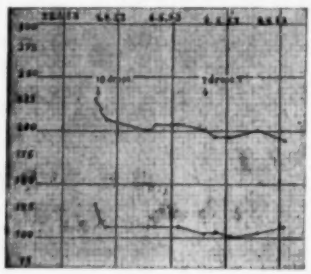

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ACQUIRED CARDIOVASCULAR DEFECTS

A. DEFINITIVE PROCEDURES:

1. *Wounds of the Heart*—Suture of wounds of the heart was accomplished successfully by the end of the nineteenth century, and for many years comprised the only approved type of cardiac surgery. Lacerations of the epicardium, coronary vessels, auricles, or ventricles all lead to hemopericardium and cardiac tamponade, with obstruction to venous return, low pulse pressure, muffled heart sounds, and impending death from either hemorrhage or tamponade. Immediate relief of all obstructive phenomena may be obtained by pericardial aspiration, which should be performed as soon as the patient has been examined, and while the operating room is being set up. Pericardicentesis may not only be a temporary life-saving measure, but may also be curative, since in many instances the original laceration will have become sealed. Evidence of unrelieved or recurrent tamponade, or continued bleeding, is an indication for prompt thoracotomy and control of the bleeding area, either by direct suture, or by the application of an absorbable hemostatic sponge such as Gelfoam.

2. *Foreign Bodies in the Heart*—Metallic objects may become lodged in a cardiac chamber or in one of the great vessels, either by direct entry, or by migration from other areas in the body by way of the venous system. The indications for removing these fragments include the threat of further embolization (including cerebral injury); infection; weakening of the myocardium, and the psychological hazard of knowing that such a lesion is present. The opportunity to remove shell fragments from the heart in large numbers of otherwise healthy young men, under modern surgical conditions, arose during World War II. Techniques were standardized, and highly successful series were reported by Harken and others. When a patient presents a foreign body in the heart, such as a knife blade or ice-pick, a portion of which protrudes through the chest wall, no attempt should be made to remove this until the patient has been anesthetized and the appropriate pleural cavity opened so that all manipulation can be performed under direct vision and control.

3. *Pericarditis*—The need for pericardial aspirations or pericardiotomy in the management of infections involving the pericardium has diminished markedly with the introduction of chemotherapy and the antibiotics. Pericardicentesis is sometimes still done for the mechanical relief of accumulated fluid, as well as for the direct administration of drugs.

4. *Constrictive Pericarditis*—Frequently recurring ascites and collections of pleural fluid, associated with a small quiet heart and evidence of obstruction both to venous inflow and cardiac output are the manifestation of constrictive or restrictive pericarditis with its attendant interference with filling. Profound disability and death from heart failure may result if surgical relief is not obtained. The lesion affects young males predominantly, and is most frequently attributable to infection with the tubercle bacillus, despite the frequent failure of bacteriologic or histologic confirmation.

Pericardiectomy, of as total an extent as is technically possible, is the proper treatment. A variety of incisions have been proposed for this: the vertical sternum-splitting; parasternal incision; transverse opening into both pleural cavities and transecting the sternum horizontally; and liberal left transpleural approach. Complete liberation of both ventricles is attempted; authorities differ concerning the advisability or importance of approaching one ventricle before the other. There is also a lack of agreement concerning the necessity for decorticating the auricles, venae cavae, or pulmonary veins. There is considerable risk of perforating these latter structures, as well as of causing a tear in the ventricular myocardium in the decortication, and each step must be made deliberately and cautiously in the proper plane.

The use of streptomycin, in conjunction with other drugs and accepted methods for treating tuberculosis, makes it possible currently to operate for adhesive pericarditis caused by this infection at a much earlier stage in the disease than formerly. Such operations are technically easier, and the possibility of a cure far greater, than when the disease has been of longer standing. Pericardiectomy for constrictive pericarditis associated with rheumatic myocardial or valvular damage, or with other infections, entails a higher risk and a less optimistic prognosis.

5. *Tumors of the Heart*—Definitive removal of primary tumors involving the pericardium or epicardium (lipoma) has been accomplished. However, although intracardiac tumors (myxoma of the auricle) have been diagnosed on the basis of clinical and angiocardiographic evidence, attemps at surgical extirpation of these have been failures. The removal of intracardiac tumors probably awaits the clinical use of an artificial circulation.

6. *Pulmonary Artery Embolism*—The operation described by Trendelenberg consists of removing an obstructing blood clot from the main pulmonary artery. The procedure has occasionally succeeded in saving the life of an otherwise doomed individual. While technically feasible, it is rare that the qualified surgeon and required equipment can be assembled sufficiently instantaneously to permit performance of the embolectomy before the patient has died.

7. *Cardiac Arrest*—Sudden cardiac standstill may develop in the course of any major or minor operative procedure, including bronchoscopy. It may also complicate treatment performed away from the operating room. The underlying mechanism for this catastrophe is generally conceded to be hypoxia, whether this is on an anoxic (obstructed air way), anemic (blood loss), reflex, metabolic, or other basis. Successful outcome

depends upon prompt recognition of the condition and the institution of immediate measures to restore the circulation.

When the surgeon is working within the chest, he is in an excellent position to observe the development of cardiac arrest, and to institute treatment promptly. Even here, however, it is often the anesthesiologist (or electrocardiographer) who will be the first to detect the complication characterized by absence of detectable blood pressure and pulse. When the surgeon is operating elsewhere in the body it must almost always be someone at the head of the table who will give the danger signal if effective action is to be taken. The selective susceptibility of brain cells to anoxemia is such that irreversible damage probably commences within three minutes of cessation of heart beat. Although patients have been successfully resuscitated after longer periods of asystole, most of these have residual evidence of brain damage ranging from minor personality changes and performance handicaps to a catatonic, convulsive, or frankly decerebrate state.

Effective cardiac resuscitation depends on the promptness with which an adequate airway can be established, and manual rhythmic cardiac compression ("cardiac massage") instituted. Mouth-to-mouth breathing may salvage the situation until an intratracheal tube can be passed, any obstructing secretions aspirated, and the lungs regularly insufflated with oxygen.

The surgeon operating within the abdomen may be tempted to massage the heart through the intact diaphragm, or by way of an incision into the left side of the chest through the diaphragm; instances of success achieved by this method have been recorded. All too often, however, time so spent is wasted, as is the time invested in tests to confirm the diagnosis or to stimulate a heart beat by the intracardiac injection of drugs through the chest wall.

The left pleural cavity should be entered boldly by an incision made an interspace below the left nipple, without regard for the niceties of skin preparation or for sterility of instruments or of the operator's hands. Manual compression should be started immediately. A rib-spreader should be inserted as soon as it becomes available, otherwise the wrist of the intrathoracic hand will tire quickly when compressed by the ribs. The pericardium should be opened, the apex of the heart grasped in the hollow of the palm of the left hand, and smooth but forceful rhythmic compression carried out at a rate of 60-80 per minute. Hearts have been ruptured during manual compression. As an alternate maneuver the heart may be compressed against the under surface of the sternum. The surgeon may change hands as indicated and may take turns with other members of his team.

If effective compression has been instituted promptly enough, and if the underlying cause of the standstill can be eliminated, the chance of success is good. A flabby heart can usually be converted to a firm contracted organ, which can be felt to fill with blood between manual compressions; a pulse may become palpable at the wrist, blood pressure be obtainable, and dilated pupils become small again. Occlusion of the descending thoracic aorta may result in an increased flow of blood to the brain and myocardium. If spontaneous cardiac systole does not return within a few minutes, the injection of two cubic centimeters of 10 per cent calcium chloride, or of 1/2 cubic centimeter of 1:1000 epinephrine, singly or in combination, may stimulate a good heart beat. Either ventricle has been used as a point of entry. If ventricular fibrillation occurs, the heart should be massaged to a tonic state, electrically shocked into standstill, and rhythmic compression reinstituted.

How long should one persist in efforts to restore an arrested heart beat? A categorical answer to this cannot be given, since patients are alive and well whose hearts have been massaged for many (up to 10) hours. On the other hand, other conditions such as hemorrhage or irreversible brain damage, usually influence the operator to stop after 30 minutes or so. Recent work on electrical stimulation (Zoll) suggests that a non-operative method may be applicable to certain cases. It must again be emphasized that the person who discovers cardiac arrest is obligated to institute treatment immediately; if one waits until a surgeon can be found the opportunity for salvage will be lost.

B. PALLIATIVE PROCEDURES:

1. *Rheumatic Heart Disease with Mitral Stenosis*—Of all the operations suggested for the relief of acquired valvular disease or myocardial insufficiency, the only procedure currently to gain wide acceptance has been the opening of the stenotic mitral valve by way of an approach through the left auricular appendage. Although this approach had been used successfully in one case by Souttan in England in 1925, it remained for Bailey in Philadelphia and Harken in Boston, to reintroduce and popularize the method during the late 1940's.

Stenosis of the valve results in left auricular enlargement, pulmonary engorgement and in increased strain on the right heart. Prolonged valvular obstruction is accompanied by stasis and structural changes in the pulmonary vasculature.

The diagnosis can usually be accurately made on auscultation alone. X-ray evidence of an enlarged left ventricle indicates an associated significant mitral insufficiency. Cardiac catheterization is not required often, but it makes possible an exact record of the degree of pulmonary hypertension. Most cardiologists reserve operation for those patients who have developed symptoms referable to the lesion, which cannot be adequately controlled by a careful cardiac regime, including digitalis, diuretics, and a salt poor diet.

Indications for surgical relief include dyspnea, orthopnea, fatigue, exercise intolerance, pulmonary hypertension, hemoptyses, cardiac decompensation, and repeated peripheral arterial emboli. In the last situation, amputation of the left auricular appendage accompanied by flushing of the auricle is performed. Statis is eliminated by opening the stenosed mitral orifice. This procedure has resulted in a marked decrease in the incidence of emboli, in contrast to the large unoperated group.

Contraindications to surgery include active rheumatic fever, subacute bacterial endocarditis, significant associated valvular lesions, significant enlargement of the left ventricle, or associated non-cardiac disease of sufficient magnitude to preclude successful cardiac surgery. Active rheumatic fever may be impossible to determine by criteria currently available. Aschoff bodies were reported in almost 30 per cent of the auricular biopsies of the first 50 cases at the Montefiore Hospital, and this finding has been substantiated in other clinics. The proper interpretation of this observation is not available at this time, since most of these patients have shown no clinical evidence of active rheumatic infection either pre- or postoperatively.

The mitral valve may be opened effectively either by finger fracture or by instrumentation. It is intended that this opening be made along the lines of fusion of the mitral cusps—the so-called "commissures". When the left auricular appendage is not available because of thrombosis, giant enlargement, or adhesions, the left atrium or left superior pulmonary vein may be used, but these approaches are neither as satisfactory nor as safe. With proper selection of patients, adequate preoperative preparation, and attention to surgical detail, an overall mortality of about 5 per cent may be achieved. Patients who had been totally invalided before operation have been restored to a state of sociologic and economic self-sufficiency. It is too soon to predict how long they may be able to maintain this extraordinary improvement, and whether or not any recurrence of the stenosis may be anticipated.

C. EXPERIMENTAL PROCEDURES:

1. *Mitral Insufficiency*—Bailey and Harken have each performed a number of different operations in attempts to alleviate this defect. Bailey has devised various techniques for passing pericardial slings around, or sutures actually through the valve cusps. Harken has fixed plastic balls, of a variety of shapes, under the lesser leaflet, in an attempt to narrow the orifice during systole. Satisfactory results have not been obtained with any degree of consistency. Agglutination of the chordae tendinae and calcific rigidity of the valve cusps are two of the pathologic features of mitral insufficiency that would prevent success by either of these methods.

2. *Aortic Stenosis*—Tuffier succeeded in dilating a stenotic valve in 1914, by invaginating his finger along the intact aortic wall and opening the valve orifice. Numerous attempts to pass instruments into the aortic valve by way of the right common carotid artery have led to fatalities due to perforations of a sinus of Valsalva or other false passages. Attempts at digital dilatation of the aortic valve by way of the left auricular appendage and mitral orifice, or directly by the left ventricle, have also resulted fatally. Currently a procedure is being evaluated which consists of introducing a dilating instrument into the aortic orifice through an incision in the wall of the left ventricle.

3. *Aortic Insufficiency*—Repair or replacement of the regurgitant aortic valve has thus far eluded accomplishment. Hufnagel has inserted a plastic valvular prosthesis into the aorta just beyond the origin of the left subclavian artery, as an approach to partial solution of this problem.

4. *Coronary Insufficiency*—The problem of increasing the supply of arterial blood to the myocardium rendered ischemic by atherosclerotic involvement of the coronary arteries has stimulated a most energetic experimental approach. Various tissues have been sutured to the epicardium, including omentum, pectoral muscle, lung, and pedicled skin and muscle flaps. Sterile chemical pericarditis has been induced by a number of irritants, to produce granulation tissue. The open end of the divided left internal mammary artery has been tunneled into the myocardium. The coronary sinus has been ligated. Beck has arteriolized the coronary sinus by anastomosing a graft between the aorta and the coronary sinus. Direct anastomoses to a coronary artery have been proposed. None of these methods has achieved more than a limited usefulness at this time. Thoracic sympathectomy and thyroidectomy by surgery or radio-active iodine are among the other methods under investigation. This important problem still awaits solution.

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SPECIAL ARTICLE

INCIDENCE OF CARCINOMA IN ASSAM*

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AND

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INTRODUCTION

Statistical analysis of tumours should always be confined to well-defined homogenous group of tumours based on pathological findings. Sweeping statements about cancer in general, without clear specification of the constituents including incidence of disease based on unconfirmed statistical data are useless. It is an essential prerequisite of any statistical investigation that the accuracy of primary data and the primary data in tumour statistics are chiefly based on the histopathological diagnosis of the cases studied. Difficulties are many in citing data of statistical significance, as useful data that could be collected from a hospital is bound to be misleading as to the frequency of cancer in age groups, different sexes and organs of the body, etc. Certain statistical fallacies which are evident in hospital practice can be mentioned here.

SELECTION OF CASES

More males attend the hospitals than females and this chiefly increases the statistical error of sex incidence. Statistical difficulties are much more magnified by selection of patients that are admitted into the hospital owing to varying degrees of selection. Some of the obvious selecting factors are—(i) the presence in the hospital of special clinics or wards in charge of individual clinicians particularly interested in special groups of cases, e.g., gynaecological, dermatological, otolaryngeal, etc.; (ii) the relative number of male and female beds in different hospitals; beds for male patients are proportionately higher in general surgical wards; (iii) actually acutely ill patients are admitted into the hospitals in preference to the less acute or ambulatory cases. These statistical fallacies as well are applicable to cancer patients.

POSTMOTEM FINDINGS: Postmortem findings are important in order to investigate the doubtful cases of cancer and it is not of very great importance in so far as statistics of cancer are concerned. It is a well known fact that in this part of the country it is almost impossible to obtain permission for an autopsy even when the diagnosis is in doubt. Thus a vast amount of valuable pathological materials including many unsuspected and undiagnosed cases from which the medical men could be enormously benefited are buried or burnt. If these bodies were available greater number of necropsies would have been performed and these would eliminate doubt in a number of cases which would be utilised for statistical and research purposes.

VITAL STATISTICS—It forms a big part of statistics in every country but no reliable figure of vital statistics are readily available in this country and the mortality figures, if any, are based on the diagnosis written on death certificates. The diagnosis of such cases however, is far from satisfactory when compared with those in which necropsies are done, as those cases are often diagnosed under the worst conditions of remote or busy general practice.

These and other factors, for which it is quite impracticable to make any qualitative allowances, render hospital and other available statistics of comparatively little value for the purpose of estimation of the relative frequencies of cancer on a statistical basis.

MATERIALS AND METHODS

The cases mentioned in this paper represent those biopsy and necropsy materials that were received in the department of pathology, Assam Medical College, during a period of four years from the 27th May 1949 to 30th June 1953. The figures include cases which either confirmed the diagnosis of clinicians or diagnosed the undiagnosed or unsuspected ones referred to by them. These include not only the patients admitted into the hospital, but also biopsy materials from cases sent from various hospitals in different parts of Assam. These, of course, represent only the few who attended the hospital for operation and treatment. On the other hand these represent nearly average samples of carcinoma that occurs in the community at large.

The diagnosis in every case was made by routine histopathological examination of the excised tumours or of tissues removed by biopsy or those obtained by necropsy and the staining of the tissues was usually done with iron-haematoxylin method. Other staining methods were also adopted for confirmation, whenever necessary.

INCIDENCE OF CANCER

Table 1 represents the number of cases that were studied in this series. They are arranged according to the organs that are involved including the sex incidence.

DISCUSSION

In this series malignant tumours of every organ was met with. The lymph glands include the secondaries of which the primary growths were also noted in the series whenever available, but there are some instances in which the primary could not be found out definitely, the site of primary affection being an internal organ.

Out of eight carcinomas of the liver, mentioned in Table 1, three were primary and the remaining five were secondary. Of these secondary growths, the

*An abstract of this paper was read by the first author in the Assam Provincial Medical Conference, Nowgong, Assam, January, 1953

TABLE I

Histological diagnosis	*1949 From 27-5-49*			*1950*			*1951*			*1952*			*Upto 30-6-53*			*Total*
	M	*F*	*T*	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*	*T*	*M*	*F*	*T*	
Lip	—	—	—	—	—	—	—	—	—	3	—	3	1	—	1	4
Tongue	—	—	—	2	1	3	4	3	7	4	—	4	6	1	7	21
Cheek	—	—	—	2	—	2	3	—	3	3	1	4	—	—	—	9
Mandible (gum)	1	—	1	—	—	—	3	3	6	7	1	8	—	—	—	15
Palate	—	—	—	1	—	1	2	1	3	1	2	3	—	—	—	7
Tonsil	—	—	—	3	—	3	4	—	4	9	1	10	6	2	8	25
Pharynx	2	—	2	—	—	—	2	—	2	7	—	7	5	—	5	16
Larynx (external)	5	—	5	24	4	28	13	3	16	44	2	46	24	—	24	119
Oesophagus	—	—	—	4	1	5	5	—	5	8	1	9	12	1	13	32
Stomach	—	—	—	1	—	1	—	—	—	5	3	8	1	—	1	10
Small intestine	—	—	—	—	1	1	1	—	1	—	—	—	—	—	—	2
Colon	—	—	—	—	1	1	—	—	—	1	1	2	1	—	1	4
Rectum	1	—	1	1	1	2	—	—	—	5	1	6	2	3	5	14
Liver	2	—	2	1	—	1	2	—	2	1	—	1	1	1	2	8
Gall bladder	—	—	—	—	—	—	1	—	1	1	—	1	—	1	1	3
Lung	—	—	—	2	—	2	—	—	—	1	—	1	3	—	3	6
Skin	6	—	6	6	1	7	5	—	5	17	—	17	10	—	10	45
Breast	—	1	1	—	4	4	—	6	6	—	5	5	—	6	6	22
Uterus (body)	—	—	—	—	—	—	—	3	3	—	3	3	—	1	1	7
Cervix uteri	—	2	2	—	5	5	—	4	4	—	4	4	—	2	2	17
Ovary	—	1	1	—	5	5	—	3	3	—	3	3	—	1	1	13
Penis	7	—	7	3	—	3	5	—	5	11	—	11	5	—	5	31
Testis	1	—	1	—	—	—	1	—	1	2	—	2	1	—	1	5
Kidney	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	1
Prostate	—	—	—	1	—	1	1	—	1	—	—	—	—	—	—	2
Urinary bladder	—	—	—	1	—	1	1	—	1	—	—	—	1	—	1	3
Thyroid	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	1
Maxilla	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	1
Nasal cavity	—	—	—	1	—	1	1	—	1	1	—	1	—	—	—	3
Lymph glands (secondary)	4	1	5	8	4	12	13	4	17	22	6	28	13	3	16	78
Salivary gland	—	—	—	2	—	2	2	—	2	—	—	—	—	—	—	4
Placental tissue (chorion epithelioma)	—	—	—	—	3	3	—	2	2	—	—	—	—	—	—	5
Brain	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	1
	29	5	34	66	31	97	70	32	102	153	34	187	92	22	114	534

N.B. M—Male, F—Female, T—Total.

primary carcinoma could be traced in the stomach in three cases, in the gall-bladder in one, and in the lung in another. The growths in the lungs were all primary bronchial carcinoma. In the ovary, two were metastatic growths from carcinoma of the stomach (Krukenberg tumour). The carcinomas in the kidney and brain mentioned in the table were metastatic in origin from a primary growth of bronchial carcinoma, which also involved the liver as already mentioned. The growths in the salivary glands mentioned in the table, were mixed parotid tumours undergoing carcinomatous changes. From the statistical point of view, however, if all metastatic growths were excluded from the series, the incidence of carcinoma in the organs is not appreciably affected.

It also shows that except the organs of reproduction and the breast, in each of these groups, the incidence predominates in the males. The reason may be the paucity of the female beds in the hospitals, or the females do not care to attend the hospitals, or the disease may be really less in them. It can be found by further investigations only.

Age incidence—Again, it is well known, that cancer is mainly a disease of the elderly i.e. above forty years of age. But in the series under review the lowest ages recorded are:

Carcinoma of tongue	...	30 years	
,, ,, tonsil	...	25 ,,	
,, ,, mandible	...	30 ,,	(Jaw)
,, ,, larynx	...	27 ,,	
,, ,, oesophagus	...	30 ,,	
,, ,, stomach	...	25 ,,	
,, ,, rectum	...	25 ,,	
,, ,, skin	...	30 ,,	(Melanoma)
,, ,, penis	...	23 ,,	
,, ,, ovary	...	18 ,,	(Krukenberg's tumour)
Mixed Parotid tumour undergoing malignant change	...	18 ,,	

The ages of onset of symptom and the age at diagnosis (as recorded) would give only rough indications of the real ages of onset of the tumours, which

evidently must be much earlier than the actual onset of the disease.

From Table 1, it is pertinent to ask whether the incidence of cancer as a whole has increased demonstrably in recent years under the stress and strain of life. But in deciding whether this increase is real or apparent, some factors have to be borne in mind. It may be due to the fact that formerly cancer cases could not be diagnosed for lack of facilities or that the people are becoming more and more hospital minded now. Improvements in the methods of diagnosis have an appreciable effect in tackling the problem, as it is only within recent years that many radiographic, endoscopic and pathological methods of diagnosis have been introduced and are attaining perfection. One factor must be borne in mind that, nowadays, with a better standard of living, expectation of life is increased and one has an opportunity of seeing more canncer cases in elderly persons.

The hospital records, however, show that an increasing number of cancer patients is attending the hospitals every year for treatment and surely there are still many who do not care to attend the hospitals due to ignorance and many go outside the state for treatment. So if correct statistical data of all the cases could be collected, the total number would be an astonishingly huge one.

Site—It is important to ascertain whether a particular kind of tumour shows distinct trends as far as invasion of tissue is concerned. The study of the series will show that in Assam, of all carcinomas, incidence of external laryngeal carcinoma is highest; carcinoma of the buccal cavity as a whole and the rest of the alimentary system come next in order of frequency. The relative frequencies with which the various sites are affected will vary because of exposure to external irritating agents producing carcinogenic stimuli or acting as carcinogenic agents resulting from peculiarities of custom, habits and occupation of the people.

External laryngeal carcinoma—About the possible aetiology of high incidence of carcinoma of larynx it may be mentioned that in Assam, the people are in the habit of chewing betel-nuts, specially prepared, along with liime and pan (betel-leaf). These betel-nuts are prepared in the following manner—the ripe betel-nuts are kept buried in the earth without any container and without peeling off the skin. These are taken out after a few months and after cleaning and washing, are ready for use. These remain moist and have an astringent taste due to the richness of the tannin in it. Betel-nuts are taken in other parts of India also, specially Bengal, but nothing of this type has been reported as yet. The peculiar features in these cases are that the people in Assam take this special form of betel-nuts mixed with lime and both these together might set up an irritation of the larynx and predispose it to carcinomatous changes due to irritation.

Here is an almost virgin field of research. Exploration by a team of competent workers would surely reveal the nature of the carcinogenic factors.

The incidence of external laryngeal carcinoma was highest in the age group 40 to 50 years, though cases as low as 27 years of age and as high as 70 years are also recorded.

Conclusion

Carcinoma is a non-preventable disease. Its earliest symptoms are sometimes insignificant and negligible and the patient remains ignorant of his disease until some complication, such as pain, bleeding, etc., compel him to seek medical advice. People must be educated about its earliest symptoms by intensive publicity campaign. Its inevitable result will be a great increase in the number of early cases of carcinoma attending the hospitals and consequently proper treatment may be instituted with greater chance of cure.

It is not possible for a general practitioner to give adequate scientific treatment. So whenever the patient presents features suggestive of carcinoma or slight suspicion of the disease he should be subjected to thorough investigation in an institution where there is every facility for proper investigation, study, research and treatment by various modern methods.

Acknowledgment

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PUBLIC HEALTH

PREVENTION OF TUBERCULOSIS*

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Is tuberculosis, claimed by some to be a dying disease, such a factor that its prevention constitutes a major problem? It certainly is. Last year's WHO report estimates that tuberculosis kills 5 million people a year. Considering that the two atom bombs dropped on Hiroshima and Nagasaki caused the deaths of 120,000 people, it would take more than 90 atom bombs to achieve the same loss of life as tuberculosis causes every year. On a global scale tuberculosis is even a bigger killer than malaria of which 3 million die annually. Moreover, tuberculosis is by far the subtler and more treacherous of the two. In the beginning, at least, malaria announces itself by high fever and other signs of illness which are difficult to overlook. Tuberculosis, on the other hand, assaults its victim silently and implacably, faking sometimes even an appearance and a feeling of particular well-being so

* Part of a symposium on Tuberculosis held at the Annual Meeting, Jaipur Branch, I.M.A., October 25, 1953.

that in very many cases it is too late for cure when the disease is being detected.

India is getting her full share or more of the ravages wrought by tuberculosis. During World War I the following figures had been reported (Cummins, 1923, quoted by Clarke, 1952): among 10,000 British troops active tuberculosis was found in 6 and 0·4 died of it; among Indian troops the corresponding figures were 93 and 17 respectively, and for the Indian labour corps 142 and 53. That nothing changed during the 35 years that elapsed since then is demonstrated by the figures of tuberculosis mortality established in India by WHO (Annual Report, 1952). Field surveys carried out in Delhi area and Trivandrum, in Rangoon and Bangkok showed that in this whole region of South-East Asia the tuberculosis mortality exceeds 300 per 1,00,000. This is a terrifying figure, particularly when compared with the U.S.A. or Western Europe where mortality rates of about 20 prevail; it is the figure which was found among non-whites in the U.S.A. more than 40 years ago.

A similar impression of tuberculosis being incomparably more prevalent in India than in Europe arises from the official results of mass-radiography (Benjamin, 1952). In Madanapalle, Trivandrum, Faridabad, Madras and Delhi the number of cases of tuberculosis per 1,000 of examined people were respectively 11·6, 12, 14, 15, and 18. Compared with 3 to 4 in Copenhagen and 6 in Belfast, North Ireland, where mass surveys have established these rates just after the last war, our mortality rate is at least two to three times higher. Based on a mortality rate of 300 per 1 lakh a figure of 5 million cases of active tuberculosis and 1 million tuberculosis deaths per year should be expected. Even if these figures should prove too high by a few per cent, there can be no doubt about the magnitude and urgency of the tuberculosis problem in our country.

The next question is whether tuberculosis is preventable on a large scale.

That tuberculosis can be prevented has been proved by every progressive country. In the U.S.A. the mortality rate of tuberculosis per 100,000 of the population in 1911 was 220 for whites, 308 for non-whites; in 1951 the corresponding figures were 12 and 41 respectively (Bonnett *et al*, 1953). In Holland, ravaged by the Nazi invaders, in 1945 the tuberculosis mortality per 100,000 was 86, 1948, 28; in Sweden in 1946, 51; in 1949, 28.

To prevent tuberculosis from spreading, it is desirable to find the cases suffering from infectious tuberculosis, the 'open' cases whose sputum contains tubercle bacilli, of which several hundred million are coughed out every day by one single case. The most dangerous sources are the unknown, undetected cases, whom nobody suspects to be tuberculous, so that neither they themselves nor their 'contacts' take any precautions regarding sputum hygiene. Mass radiography shows that the heaviest infected age groups are those between 15 and 34 and that another maximal incidence occurs at about 60 which explains the experience that infants often acquire their tuberculosis on the lap of their grandparents. On the other hand, in the age groups below 15, infectious cases hardly occur. It is noteworthy that even mass radiography is by no means an infallible method. Comstock and Burke (1951) followed up the tuberculosis deaths in all the people of a county in Georgia, U.S.A., for three and one half years following a mass survey; they found that one-fourth of them had been found free from tuberculosis.

Next to the finding of the infecting source, the most urgent task is to trace the 'contacts'. A recent investigation in London showed that 7 per cent of all family members are infected if one open case is present. The great influence of the environment is clearly illustrated by the fact, also established in London, that when housing conditions are good, the tuberculosis rate among child contacts is 8 per cent, among adult contacts 5 per cent, whereas under bad housing conditions the corresponding figures are 15 per cent and 7·5 per cent (Hartston, 1952).

In the U.S.A. some tuberculosis experts (Myers, 1953) are of the opinion that all that is required to prevent tuberculosis is to "seek, find, segregate and treat the (infective) case". This may be true for a country where hospitalization is no problem due to an abundance of tuberculosis beds in hospitals and sanatoria and where people discharged after treatment return to a good or a tolerable home.

In India to find a case requiring institutional treatment is an embarrassment; for the estimated minimum number of 25 lakhs active cases of tuberculosis there are 11,294 hospital beds in the whole country (Benjamin, 1952). How long it would take to provide sufficient beds for all who are in need of them, even if only shacks are built, nobody can predict. Therefore, every other avenue likely to alleviate this formidable problem must be explored.

The most important non-medical factor in the prevention of tuberculosis is to relieve *overcrowding*. The London County Council keeps a list of overcrowded houses; 35 out of every 1,000 houses are marked as overcrowded and annually 7 out of every 1,000 families in London are added to the list of families rated as living under conditions of overcrowding. Whenever any of the lodgings become available which the L.C.C. is building continuously in the suburbs of London, they are allotted to people living in overcrowded quarters with special preference for tuberculous families of which more than 30,000 are registered; this sometimes goes so far that such cottage estates harbour more cases of tuberculosis than the neighbours like it (Walker, 1952).

Overcrowding is also here, probably, the main reason why tuberculosis has become such a problem. When after partition some one hundred thousand refugees poured into Jaipur city, where housing condi-

tions had not been too good before, this and the influx of new tuberculosis strains, against which no local resistance existed, led to the present alarming incidence of tuberculosis which seems to have become our public health problem no. 1, outranking even malaria.

It is to be expected that the very substantial increase of housing space, thanks to the admirable energy which created the refugee colony of Fatehtiba (Jaipur), will soon be followed by a decrease of tuberculosis incidence, provided the infectious cases are segregated and the resistance of the not infected people increased by all possible means.

Among the many factors which contribute to good housing from the point of view of tuberculosis prevention, *cross-ventilation* is one of the foremost. That is so because infection is rarely effected by inhaling sputum particles fresh and moist from the cougher's mouth; they are usually too big and sticky to penetrate into the alveoli. The same is true of the smallest sputum droplets whose water content evaporates leaving behind the highly infectious droplet-nuclei floating in the stagnating air of the living or bed room unless quickly driven out by effective cross-ventilation.

In Western countries a considerable success in prevention of tuberculosis could be achieved by fighting bovine tuberculosis. In America this was done by slaughtering all tuberculin-positive cattle, in England by segregating them. In India the bovine factor is probably not of great importance, all milk being boiled before consumption while cream which might be taken from unboiled milk does not constitute an essential item in our diet.

Of immeasurably greater importance it would be *to increase the resistance* of the population to tuberculosis infection by all means at our disposal. They can be classified as general or unspecific, and as specific means.

Of the former the most important seem to concern nutrition, illustrated by the following facts. During the First World War, when Holland was neutral and exposed to enemy interference, only as the blockade very considerably restricted the meat imports on which their animal protein intake largely depended, the tuberculosis mortality there increased by 41 per cent. In the equally neutral and unmolested Denmark, due to extremely heavy meat export only the bread ration remained unaffected, whereas fat intake was reduced to one half and meat to one fourth. Simultaneously the tuberculosis mortality increased by 30 per cent. There was no change in housing conditions in either of these two states. In England, where animal protein supply remained fairly well maintained, the number of tuberculosis deaths increased only by 17 per cent. In 1946, FAO published a graph which clearly shows that animal protein consumption and tuberculosis mortality are inversely proportionate. In most of the countries where about 50 to 60 g. animal protein are being consumed the mortality is 20 to 30 per 100,000; where the animal protein intake is between 20 and 30 g. the mortality rate is between 50 and 60. Exceptions are countries like France or Germany where war damage overshadows even the protective influence of good protein.

According to FAO statistics the animal protein consumption in India in 1951-52 has been 6 g. per head a day, the lowest figure recorded anywhere in the world, except in China and Indonesia where it is 5 g., and lower by 2 g. than the prewar level in India. Adding to this that the total caloric value of the daily per capita food in India for the same period amounted to just 1600 calories and comparing this with the corresponding figures of 63 g. animal protein and 3120 calories for the U.S.A. (FAO, 1952), we shall realize how imperative it is to look for help to specific methods to increase our resistance of which B.C.G. vaccination is the most effective.

B.C.G. vaccine is being prepared from the bacillus Calmette-Guerin, which is a bovine tubercle bacillus, cultured from the udder of a tuberculous cow in 1902, and systematically attenuated, that is reduced in virulence, since 1908 by Calmette and Guerin by frequently sub-culturing it on potato-bile-glycerine media. In 1922, Weill-Hallée started oral vaccination of newborn infants in France, and in 1927 intradermal vaccination on a fairly large scale was begun in Scandinavian countries.

At present, all over the world B.C.G. vaccine is prepared from the strain originally cultured at the Pasteur Institute in Paris. The vaccine which is used in India and the whole S. E. Asia region is being prepared at the King Institute, Guindy, Madras. The vaccine must be used within a few days of manufacture unless it has been subjected to dry-freezing.

Of a solution which contains 0·5 mg. per 1 ml., 0·1 ml. is injected intracutaneously on the outer surface of the left upper arm. Provided that vaccination is applied only if the Mantoux test it negative, the reaction is mild and consists in the development of a small nodule or shallow ulcer at the site of vaccination with a swelling of the axillary glands; no treatment is required for any of these manifestations. Representing a modified primary complex with the primary focus in the skin and the regional glands in the axilla, complete healing takes place if left undisturbed.

If B.C.G. vaccination is carried out in people who have a positive Mantoux test or are in the pre-allergic stage of a fresh primary tuberculosis infection, a more violent reaction may develop with deeper ulceration or localized necrosis (Koch's phenomenon); but even then nothing worse happens. To avoid such a development, the earlier B.C.G. workers insisted on six weeks segregation of prospective vaccinees so that freshly infected ones would be excluded from vaccination. They also demanded 6 weeks segregation following vaccina-

tion so as to give the vaccinated people a chance to develop resistance. It takes 6-8 weeks after vaccination for the Mantoux test to become positive and the maximum resistance to infection is reached after about 6 months. The protective effect of one B.C.G. vaccination lasts for at least 3 years but is often maintained for 5, 6 or even 10 years. In primitive conditions where it is difficult to get people for several tests it has been suggested to carry out B.C.G. vaccinations even without preliminary tuberculin testing and to repeat the vaccination every three years automatically just like in smallpox inoculation. At present, segregation before and after vaccination is carried out only when exact statistical data are to be obtained.

The main questions which we have to answer are: is B.C.G. vaccination harmless, is it effective, and, if so, how much protection can be expected.

One can say without reservation that B.C.G. is harmless. A doctor injected himself 2·0 g. vaccine, which is 20,000 times the usual dose, and suffered no by- or after-effects. Apart from large numbers in Russia and Japan, about 40 million (4 crores) people have been B.C.G. vaccinated and not one single case has been reported where any kind of illness developed as a consequence of vaccination. On the contrary, many statistics seem to show that quite apart from the tuberculosis preventing effect, in vaccinated population groups mortality rates decrease. In India about 20 million people have been tested and 7·5 million received B.C.G. vaccination upto the end of September, 1953.

Rajasthan, true to its reputation of backwardness, shows some of the lowest figures among all the Indian States; only *ca.* 6 lakh people have been tested and 2 lakh have been vaccinated. Fortunately, on Novr. 2, 1953, a mass campaign has been scheduled to start and it can be only hoped that all medical people will do their best in convincing the largest possible number of people to volunteer for the tuberculin testing and, if negative, for vaccination, which seems the more urgent as on the basis of WHO figures for tuberculosis mortality every year about 60,000 die in Rajasthan of tuberculosis and, according to tuberculin tests which I performed on 300 medical students of our College, one third are tuberculin negative and require B.C.G. vaccination.

The usefulness of B.C.G. vaccination and the extent of protection which it confers will be seen from the following published reports. The example set by the work of Heimbeck (1948) contains already all the relevant factors. Fifty per cent of student nurses in Oslo were found to be tuberculin (Pirquet) negative and by 1924 it was known that 29·6 per cent of them acquired tuberculosis while under training, whereas of the tuberculin positive group only 2·6 per cent showed an active process. B.C.G. vaccination was started for volunteers and in 1927 the morbidity rate for tuberculosis was reduced to 2·3 per cent in the B.C.G. group. In 1930-31 when the vaccine got weaker due to poor laboratory methods, the case number increased, to be reduced even below the previous level when the strain recovered its immunizing powers. By 1936 no unvaccinated controls were available as all the nurses insisted on being vaccinated. For the whole duration of this observation the figures per 1000 are 24 cases of tuberculosis and 2·1 deaths in the vaccinated group against 141 and 14·6 respectively in the control group.

Wallgren (1947, 1950) in Gothenburg, Sweden, found the following figures for the tuberculosis mortality per 1,000 infants in subsequent 5 year periods: 1912-16, 1917-21, 1922-26: 4±0.5. In 1927, when he started intracutaneous B.C.G. vaccination, the mortality rate was 3·9 per mille; 1928-32 it dropped to 1·4, in 1933-37 and 1938-41 to 0·5 and was zero in the following 5-year period.

From 1926-35, Soheel (1935) in Oslo vaccinated 295 medical students and kept 207 as control; calculated per 1000, in the former group occurred 19·5 in the latter 46 cases of tuberculosis.

In Chicago Cook County Hospital, Rosenthal, Blahd and Leslie (1945) carried out a 10 year follow up of infants of parents free from tuberculosis. Of 1302 vaccinated ones, 4 got tuberculosis and one died; of 1276, kept as controls, 27 became tuberculous and 7 died. In another series these workers tested the protective power of B.C.G. vaccine on infants of tuberculous parents. Of 98 vaccinated ones, one developed tuberculosis and none died, of 63 controls 4 became tuberculous and 3 died.

Aronson (1948) and Palmers worked among American Indians from Arizona to Alaska for eleven years, preparing B.C.G. vaccine in their own 13 field laboratories so that it was never older than 3 days at the time of being used. The vaccinated people were not segregated at all but returned immediately to their families; their age was 1 to 20 years. Among 1551 vaccinated individuals 51 cases developed tuberculosis and 6 died, of whom 2 were vaccinated apparently during the pre-allergic stage. Of 1457 unvaccinated controls 259 contracted the disease and 53 died. Moreover, the form of tuberculosis among the vaccinated usually was much milder than among the control group. Simultaneously a series of new borns was followed up. Of 123 vaccinated ones died none of 139 non-vaccinated died 4.

Ferguson and Simes (1948) watched for 12 years a well matched, strictly controlled, statistically unobjectionable series of North American Indian infants belonging to a heavily infected community which showed almost 69 per cent of infection at the age of 9 and mortality of 800 per 100,000. Of 306 vaccinated ones 2·95 per thousand became tuberculous and 0·99 died; for 303 controls the corresponding figures are 15·7 and 14·9 respectively.

A mass investigation deserves to be mentioned which was carried out for 10 years by Dahlstrom and Dits (1951). Of Swedish army conscripts 36,235 have been vaccinated and 25,239 kept as controls. In the vaccinated group the incidence of pleurisy and post-primary tuberculosis was reduced to one-fifth, the mortality rate to one third of the control group.

The most convincing experiment was carried out by nature, unaided by man. In a Danish girls' school, age groups 12 to 18, an unsuspected case of open tuberculosis in one of the teachers remained in contact with her pupils for some two months. Of the exposed girls 106 were B.C.G. vaccinated and 94 unvaccinated. Of the vaccinated group 2 acquired tuberculosis; they had to be treated with artificial pneumothorax and fully recovered. Of the slightly smaller group of unprotected ones 41 developed tuberculosis; 6 required A. P. and one died.

Many more such examples could be quoted but the facts and figures reported so far are proof enough that B.C.G. vaccination is highly effective even under very unfavourable conditions in protecting a high percentage of the population against suffering from and dying of the 'white plague'. It can be confidently predicted that the aim of our health authorities to reduce the case incidence in India to one fifth of the present staggering figures can be fulfilled, provided that we, the responsible health advisers of the nation, play our part well.

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CASE NOTES

ERYTHROBLASTOSIS FOETALIS

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Introduction

Since the discovery of Rh antigen by Landsteiner and Wiener in 1940 and demonstration of its causal relationship with erythroblastosis foetalis by Levine and others (1941) clinicians and laboratory workers all over the world have attempted to investigate the incidence of Rh and erythroblastosis foetalis in different peoples. The consensus of opinion is that Rh negative character and erythroblastosis foetalis are almost confined to the white race. Pure blooded aborigines and other peoples seem to be cent per cent Rh positive and free from erythroblastosis foetalis.

In India Rh negative incidence varies from place to place. It is about 2 per cent in Bombay (Khanolkar and Sanghvi, 1945), 1·1 per cent in Poona (Bird, 1946), 4·1 to 7 per cent in Madras (Ranganathan, *et al*, 1946), and 8 to 10 per cent in Calcutta (Greval and Chowdhury, 1943). Regarding erythroblastosis foetalis, no case was described in India up to 1946, and in that year Greval and others (1946a) stated that 'the disease does not appear to occur in India'. After that about a dozen cases in all have been reported by different workers (Greval and Chowdhury 1946b; Greval, *et al* 1948, Ranganathan, 1947).

Case Report

On 23-12-52, Professor Sant Ram Dhall in charge Government Hospital for Women, referred a pregnant woman with history of repeated miscarriages, along with her husband, for Rh investigation.

History—Mrs. D., Punjabi Hindu female, 23, married 6 years. She started menses at the age of 14 and was married at 17. Menstrual cycle 8/26 before marriage and 4/27 after marriage. May 4, 1952 was the first day of her last menses and her confinement was expected on 11-2-53.

She was married in May, 1947. The first child, a full term girl was born in March, 1948, ten months after marriage, with no complications during pregnancy, delivery or puerperium, and is alive and healthy. Fifteen months after first delivery, the second pregnancy resulted in a miscarriage of three and a half month foetus in June, 1949. Seven months later, in January 1950 her third pregnancy ended in the delivery of a four month old, healthy looking foetus. She ascribes this mishap to a journay from Amritsar to Simla, 200 miles in plains and 60 miles in hills.

In January 1951, her fourth pregnancy, also resulted in miscarriage of an ill-developed 6 month old foetus inspite of complete rest in bed. Her fifth confinement occurred in January 1952 when a wrinkled and dead 8 months foetus was born.

Now she was in her sixth pregnancy. She stated that her abdomen had ceased to grow and all foetal movements had stopped for the last few weeks.

She had never had a blood transfusion or intramuscular injection of blood.

She and her husband were quite healthy looking. There was no history or physical sign of syphilis in either of them. Both were sero-negative.

Laboratory Tests—Both were blood grouped and tested for Rh. AntiRh (anti D) serum was obtained from the department of pharmacology, College of Medicine, University of Utah, Salt Lake City 1, U.S.A.

Chown's slanted capillary method was employed. Her husband was group O, Rh positive. The woman was group B, Rh negative. Her serum was tested for the presence of anti-Rh agglutinins against group O and group B Rh positive cells suspended in normal saline and their own respective sera, 20 per cent bovine albumin not being available. Both types of agglutinins were found in her serum, albumin type more than the saline type.

To all intents and purposes, the woman appeared to be a typical case of iso-immunisation, with no hope for the foetus. She was allowed to go home with an advice to join the hospital for confinement.

Course—Her further history is as follows: Labour pains started at 4 p.m. on 25-12-53 and the same evening she was admitted to the Govt. Hospital for Women. Her general condition was found to be good with uterus of the size of 6 months pregnancy. Foetal heart sounds could not be heard and foetal parts could not be made out.

Blood transfusion was started at 1 a.m. as she started bleeding profusely. At about 2 a.m. a macerated foetus of the size of six months was spontaneously expelled along with the placenta. Five days later her serum when examined showed both types of agglutinins still present.

Discussion

This is a case of Rh iso-immunisation. The first child was born full term and is alive and healthy as usually happens in such cases, due to iso-immunisation being absent or very slight.

Second and third pregnancies resulted in miscarriage, which may possibly have been due to Rh iso-immunisation causing foetal death in utero. Fourth and fifth pregnancies resulted in premature labour most probably due to Rh iso-immunisation, as there is no other obvious cause to explain foetal deaths preceded by ill-development and shrivelling.

Last pregnancy resulted in the death of 7 months foetus and its expulsion in macerated condition a few days later. This along with the presence of anti-Rh agglutinins in Rh negative mother (with father Rh positive) provides us with sufficient justification to regard it as a case of Rh iso-immunisation of mother causing erythroblastosis in the foetus.

There is another point worth notice. The woman had six pregnancies in less than 6 years. I wonder whether the small intervals between successive pregnancies have got something to do with the disease beyond injecting fresh repeated doses of Rh antigen and thus increasing the anti-Rh agglutinin titre.

Naturally the couple is anxious to know whether there is any chance of their getting a living healthy baby. A definite reply can only be given if we can find out whether the man is homozygous or heterozygous Rh positive, i.e. whether his genetic formula is DD or Dd. If former, chances nil; if latter chances 50-50. As only the first child is alive and next 5 successive pregnancies have ended in miscarriages and premature labours the last three foetuses being ill-developed, shrivelled and a macerated respectively, the presumption is that the husband is homozygous Rh positive, the woman is highly iso-immunised and the prospects of their having a living healthy baby are gloomy indeed. However, exceptions do always occur and sometimes occur when least expected.

Summary

A case of Rh iso-immunisation resulting in deaths of siblings in utero, most probably due to erythroblastosis foetalis is described.

It is the first case described in the Punjab.

As usual the first child is alive and healthy.

Opinion is expressed that the couple's chances of getting a living healthy baby are remote.

Acknowledgment

Prof. Sant Ram Dhall, referred this case to me and made available the hospital records of the patients. My thanks are due to him. I am indebted to the Principal, Medical College, Amritsar, and Medical Superintendent, V. J. Hospital, Amritsar, for permission to publish this case. My best thanks are due to my colleagues Dr. Y. S. Bawa and Dr. P. S. Grewal for their assistance and co-operation.

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The investigations made by the author are incomplete as all Rh incompatibility cases should have complete genotyping of mother, foetus and husband.—Ed., *J. Indian M. A.*

FALLACY OF ENEMA-RESULT IN ILEAL ATRESIA

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The reported case illustrates that in a new-born baby with symptoms of acute intestinal obstruction, a very satisfactory enema result alone is meaningless.

Case Report

Baby Laxmi Ganda, male, aged five days, was shown to me twelve hours after birth for constipation, retention of urine and bile stained vomiting. Examination revealed normally formed anus and rectum, moderate distension of the abdomen with visible intestinal pattern and hyperperistalsis on auscultation of the abdomen. It was provisionally labelled as a case of ileal atresia, leading to symptoms of intestinal obstruction.

A glycerine enema with a syringe was given. In a couple of minutes, the child passed urine and after straining forcibly expelled a hard scybalous mass. It was dirty white in colour, and of the size and shape of an adult's finger. The diluted glycerine was also ejected with a squirt. No bubbling or hissing was heard to denote the expulsion of gas. Now digital rectal examination was done which showed an empty rectum and no pouching. The result of the enema was interpreted as satisfactory, particularly, in view of the fact, that vomiting stopped soon after and the child passed urine. Naturally the provisional diagnosis of atresia was withheld, and the child was kept under observation. Twelve hours later the same symptoms appeared and an enema test gave a poor result. Acute intestinal obstruction was now confirmed—probably being of the nature of bands and adhesions or defective rotation of the gut, (atresia ruled out by the first enema?).

By observing under a fluorescent screen the diagnosis of obstruction was confirmed but the parents' consent for an operation could not be obtained until the fifth day when the child developed faecal vomiting.

On exploration of the abdomen, the proximal ileum was found to be distended and ending into a blind pouch, whereas the distal two feet or so was collapsed and in continuity with the large gut. An ileostomy was performed and the abdomen was closed in layers. The child died seven hours after the operation.

Conclusion

The scybalous mass expelled by the child should have been examined for the presence of bile contents so as to ascertain the approximate site of obstruction. The mere presence of stools does not signify the patency of the gastro-intestinal tract in a newborn. Even after a satisfactory enema result, radiological and clinical examinations are indicated diagnosis. The case illustrates that the intestinal tract has a segmental nervous control and the lower bowel can function by itself irrespective of the discontinuity with the mid-gut.

In memoriam

DR. HARI HAR NATH HUKKU

Dr. Hari Har Nath Hukku was assassinated in the early hours of February 6, 1954. He was a prominent member of the Indian Medical Association.

Dr. Hukku was the President of the Lucknow Branch of the Indian Medical Association for several years and the President of the State Branch of U. P. in 1946-47. He was elected a Vice-President of the Indian Medical Association for the year 1949-50.

Dr. Hukku was born in 1885 and had his early education at Chandausi, Moradabad and Deoband. He passed the Matriculation and Intermediate examinations from Meerut. He got his medical degree in 1910. He next went to England for higher studies in medicine and obtained L.R.C.P. & S. with Honours at Edinburgh and D.P.H. at Cambridge. During the First World War, he accepted a post at Cork Street Fever Hospital, Dublin and specialised in infectious diseases. He later started private practice in London and had a good practice in West End. When he came back to India in 1920, he started practice at Lucknow. Hard working and sympathetic by nature, he soon endeared himself to the public of Lucknow. He lost his wife in early life and never married again.

Dr. Hukku had a splendid health and he acquired this by systematic physical exercise. He had a great love for literature and he used to study extensively.

His tragic death is mourned by all who came in touch with him. It is a distinct loss to the Association.

May his soul rest in peace!

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SURGERY OF THE HEART AND GREAT VESSELS

The progress of cardiac surgery is contemporary history. One can recall almost with mathemetical exactness the dates on which each milestone in its onward progress was crossed. Most of the pioneers who have striven to develop it are fortunately still with us and the magnitude of their zeal and enthusiasm shows no signs of flagging. By their examples, others have been stimulated and persistent endeavours in this branch of science in many parts of the world assuredly presage further progress in its development. A special article[1], indicating the many-sided advances in this branch of surgery appears in this issue. Fittingly enough, this article has been written by two American authors—because their country has played, and from all accounts will continue to play, a notable part in its development.

There are a few lessons that one can usefully learn from this era of progress in cardiac surgery. One is that successful accomplishment in this branch of surgery requires intensive co-operative endeavour between all those who are interested in the problem. The cardiac physician, the physiologist, the biochemist, the radiologist and of course the anaesthesiologist come into picture as much as the surgeon, and unless collaborative teamwork can be accomplished between all these various specialists—the result instead of being a harmonious symphony, can only be discordant earsplitting jazz. The day is long past—at least in this branch of surgery—when the surgeon strides on the stage as the pre-eminent *prima donna*—and although he still sometimes steals the limelight, much credit now-a-days is placed with the internists, the paediatricians, the anaesthesiologists and others—who have more or less built up the case for the surgeon and often are responsible for its successful completion. A notable example of this collaborative teamwork is seen at Johns Hopkins, Baltimore, where Dr. Miss Helen Taussig and Dr. Alfred Blalock have together striven to widen the scope of surgery in congenital cardiac lesions and have had such a large measure of success.

Another noteworthy lesson is the contribution that experimental approach has made on the various definitive problems. Examples are abounding to illustrate this point. Brock's[2] successful technique for the correction of pulmonary stenosis was developed after intensive experimental anatomical studies. Crafoord[3] and Gross's[4] work on the correction of the aortic coarctation has had extensive experimental background. Most of the recent innovations are thought of in the experimental laboratory and are perfected as the result of many trials and errors in the experimental animal. Dr. Potts, who has done so much to develop perfect cardiac operations in children, has a remarkable picture in his office in Chicago Children's Hospital. It shows a large-sized statue of a dog with the following inscription underneath: "He died so that others may live."

Certain of the cardiac operations have now established themselves and may even be said to be curative. Ligation of a patent ductus, resection and anastomosis of the coarcted aorta, pericardectomy for constrictive pericarditis, commissurotomy for mitral stenosis, are procedures that have been practised in very large numbers in many centres in the world and as far as can be judged, have been accepted by most surgeons and physicians. Perhaps, pulmonary valvulotomy can also be included in this category, although it has not been so widely accepted and practised. Certain other operations, though not curative, result in marked palliation. Blalock's shunt procedure for Fallot's tetralogy and other cyanotic lesions is an example. Dr. Blalock has performed over 1000 such operations and although some cardiac surgeons prefer now-a-days to attack the stenotic pulmonary valve directly rather than add a fifth abnormality to the Fallot's 4 lesions there is no doubt that the latter procedure improves the general condition of the cyanotic children markedly. How long and to what extent the immediate benefits will last in these children—time alone will show.

Certain other procedures are still in the experimental stage and persistent endeavours are being made in many clinics towards their solution. Amongst these are the correction of septal defects—particularly atrial, and vascularisation of the heart for coronary insufficiency. Murray,[5] Bailey,[6] Gross,[7] Hufnagel,[8] Husfeldt,[9] Swan[10] and others have endeavoured to tackle the former problem and the latter have been dealt with by Claude Beck[11] for long and recently by Bailey,[12] Vineberg,[13] and others. Finalization is yet to come but certainly is on the way.

Three problems that have defied solution until now, are correction for aortic stenosis and insufficiency and

1 Hurwitt, Elliot S. and Schein, Clarence, J.—*J. Indian M. A.*, 23: 444, 1954.
2 Brock, R. C.—*Brit. M. J.*, 1: 1121, 1948.
3 Crafoord and Nylin—*J. Thoracic Surg.*, 4: 347, 1945.
4 Gross, R. E. and Hufnagel, C. A.—*New England J. Med.*, 233: 287, 1945.
5 Murray, G.—*Ann. Surg.*, 128: 843, 1948.
6 Bailey, C. P.—*Ann. Int. Med.*, 37: 888, 1952.
7 Gross, R., *et al*—*Surg. Gynec. & Obst.*, 96: 1, 1953.
8 Hufnagel, C. A. and Gillespie, J. F.—*Bull. George Town Univ. Med. Centre*, 4: 137, 1951.
9 Husfeldt, E. and Sorensen, H.—*Journal of the Indian Medical Profession*, 1: 110, 1954.
10 Swan, H., *et al*—*J. Thoracic Surg.*, 20: 542, 1950.
11 Beck, C. S., *et al*—*J.A.M.A.*, 137: 436, 1948.
12 Bailey, C.—*J. Thoracic Surg.*, 23: 357, 1953.
13 Vineberg, A. M.—*Canad. M. A. J.*, 55: 117, 1946.

also to a lesser extent mitral insufficiency. Bailey,[14] Harken,[15] Hufnagel[16] and others have worked on these problems but consistent results are hard to get and realizing that by the very nature of things, their attempts could only be correction by blind methods—it is no wonder that success has hitherto not come their way. One certain way to perfect these blind procedures would be to get a dry heart so that the requisite chamber could be opened with impunity and the necessary repair carried out under direct vision. To this end, efforts are being directed in many centres and Dr. Gibbon[17] in Philadelphia has at least operated on one case with the help of his heart lung machine, towards the perfection of which he has given much of his fortune and his time.

No account of the current status in cardiovascular surgery would be complete without mentioning the progress that has been made in the repair and replacement of diseased arteries and veins. Arterial grafts have come to stay and preserved homologous grafts are being used more and more for dealing with multifarious types of lesions such as injuries, tumours, aneurysms etc. Grafts—'freeze-dried' can be kept almost indefinitely and can be transported to distant places. On the other hand, recently Bahnsen[18] in Blalock's clinic has reported success by directly attacking aortic aneurysms, partially resecting them and refashioning the aortic lumen—surely a most intrepid and courageous procedure.

Advances in ancillary sciences have helped materially this progress in cardiac surgery. Amongst these —anaesthesiology comes foremost in mind. The problem of smooth, safe, nontoxic anaesthesia in a light plane with easy intubation and extubation and adequate oxygenation has been solved. Safe vasopressor drugs that increase the cardiac output without accelerating the rate have been discovered. Knowledge of accurately replacing the blood lost during the operation and thereby maintaining the blood volume intact has prevented abnormal hypotensive phases during the operation. Recently hypothemia or 'hibernation' is being studied as a means of reducing markedly the metabolic needs of the individual, so that at least for a small period, the venae cavae could be clamped and intracardiac procedures attempted after opening the heart. Some success has been reported by Bigelow[19], Cookson *et al*[20] and Swan[21].

All this is fascinating study. Much has been accomplished during the last decade. One can however be certain that the next ten years will be even more stimulating and will open new ways for the alleviation of many more cardiac afflictions hitherto considered 'incurable'.

14 Bailey, C. P., *et al*—*J. Thoracic Surg.*, **20**: 516, 1950.
15 Harken, D.—Personal communication, 1953.
16 Hufnagel, C. A.—Personal communication, 1953.
17 Gibbon, H.—Personal communication, 1953.
18 Bahnsen, H.—*Surg. Gynec. & Obst.*, **97**: 225, 1953.
19 Bigelow, W. G., *et al*—*Am. J. Physiol.*, **160**: 125, 1950.
20 Cookson, B., Neptune, W. B. and Bailey, C. P.—*Diseases of Chest*, **22**: 245, 1952.
21 Swan, H.—*Ann. Surg.*, **135**: 314, 1952.

MOSQUITO AND MALARIA

In 1953, India launched the National Malaria Control programme, the world's biggest campaign against the disease. This is to be continued for three successive years. Raj Kumari Amrit Kaur has given this malaria control problem the highest priority in health matters and the Planning Commission has accepted her recommendations.

Malaria is no doubt a dreadful scourge, it has done enough mischief in crippling our nation, its worst depredations being in the rural areas. President Rajendra Prasad has rightly said that "it has all along gravely hampered our social, political and intellectual growth" and done the greatest mischief to our agriculture.

Since the time Ronald Ross observed human malaria in mosquito and established conclusively that it is the only agent to spread the disease in human life, researches have been carried on to control it. The most effective and at the same time preventive remedy appeared to be in destroying the mosquito, the carrier of the disease. The older method was to attack the breeding places but this did not give the desired result as its operation could not cover all the areas concerned and as the remedy was far too expensive. The newer method adopted, lies in spraying D.D.T. emulsion inside dwelling places and it has proved successful to a great extent.

Reports of the last year's achievements indicate that complete eradication of the disease may be within sight.

Ninety units functioning throughouut India claim to have protected a total of 75 million persons living in endemic areas. Over 15 milllion village homes were sprayed with D.D.T. and one million malaria patients treated since the programme began on April 1, 1953.

This year, 35 additional units have been added to the 90 already functioning, Each unit has a protection target of one million, and the total population protected by the end of the second year is expected to be 125 million.

The first year's operations have cost nearly Rs. 369 lakhs of which the Centre has contributed Rs. 236 lakhs and State Governments Rs. 134 lakhs. Though little-publicised so far, the programme is the largest anti-malaria campaign known to have been undertaken in the world and is expected to cost a total of Rs. 15,45,21,000 in three years.

Of this amount, the Central Government and the U. S. Technical Co-operation Administration will con-

tribute Rs. 10 crores (T. C. A. Rs. 7,72,73,000 and the Centre Rs. 2,27,27,000), U.N.I.C.E.F. Rs. 19,21,000 and State Governments Rs. 526 lakhs.

The Central and State Governments contribute mainly for the staff. Each unit contains wholetime medical officers, inspectors, field workers and office staff. During the breeding season as many as 130 field workers are recruited in addition to the regular staff.

T. C. A. provides trucks, jeeps, sprayers, compressors, stirrup pumps and D.D.T. The total expenditure on one unit came to Rs. 5,22,500 in the first year but is expected to be less in the second two years.

West Bengal has the largest number of units—16 (22 from 1955); Bombay has 15; Madhya Pradesh 8; Bihar 7; U. P., Mysore and Assam 5; Punjab and Hyderabad 4; Orissa, Madhya Bharat, P.E.P.S.U., Delhi, Vindhya Pradesh, Andhra and Madras 2; Saurashtra, Travancore-Cochin and Jammu-Kashmir 1. Four units have been divided between eight Part C States.

The only States in which progress is not reported to be satisfactory are Assam and Jammu-Kashmir. The State Governments are stated to have delayed contributing their share of the expenses.

In the third year of the programme, units willl concentrate on completely eradicating malaria from their zones. If successful, this will mean that 125 million people will be protected from the disease. The total population living in endemic areas in India is 200 million.

Seventy-five million people suffer from malaria every year in India. About 800,000 die from the disease, while countless others are weakened so much that they fall easy victims to other diseases.

In the first week of June last, the second year's campaign was started with the observance of the National Malaria Control Week. Sufficient publicity has been given and the co-operation of all people sought in this campaign because in preventive medicine the association and co-operation of the people are essential. We believe the people of our country will give unqualified support to this campaign.

MEDICAL PROFESSION TO-DAY

An analysis of the problems confronting the medical men of India has been ably made in the article entitled "The Medical Profession To-day", reproduced in this issue.

India with a population of 360,000,000 men, women and children has only 60,000 scientifically trained doctors, i.e., one doctor for every 6,000 people. In such a set-up, the doctors should have been fully employed but unfortunately the situation is entirely different.

Doctors are, in fact, facing acute unemployment, in a number of the States in India. After qualifying for practice, the doctors in most cases choose to settle in towns where various amenities are available. But the profession here is overcrowded and they fail to eke out a decent living. In rural areas there are plenty of inconveniences—no good roads, inadequate communication, lack of educational facilities for children and so forth. Social life may be said to be absolutely non-existent and no doctor who is young and beginning his professional life, would like to set up practice in rural areas and thus live in seclusion, unless he is adequately compensated.

In the towns, on the other hand, due to overcrowding in the profession doctors have to face keen competition. In the rural areas also, there is competition with the quacks.

The quacks are firmly rooted in a large number of villages. The people, steeped in poverty and ignorance prefer indigenous medicine and magic cures to scientific treatment. Absolutely cut off from the light of civilisation the rural people are still living in an age of darkness and ignorance. This is due to want of contact with towns and lack of arrangements for scientific treatment. Unless and until the rural areas are, through proper development, brought closer to towns and health centres under the scientific system of medicine are established for public health and medical relief, this unhappy and unhealthy state of affairs will continue. It is encouraging to note that West Bengal and some other States are establishing health centres in rural areas. But the rate of progress in most of the States is not as it should be. We feel, this problem should be tackled as if a war has been declared against diseases particularly in the rural areas.

To improve the standard of health of the rural people of India, it is, therefore, necessary to have full utilisation of the services of qualified medical men. This may be effected by an equitable distribution of medical men throughout the country. That again requires improvement of the villages. In the article referred to, the writer makes another point. In the services, the medical men are not given suitable remuneration. It has been suggested by the I.M.A. that the medical men in services should rank with I.A.S. officers regarding pay and other emoluments, as "they have to work harder than people in other services, being on call for 24 hours of the day and night without any extra reward." Moreover, qualified doctors employed in rural areas should be paid an adequate additional allowance as compensation.

The qualified doctor to-day has neither full employment nor does he get fair return on the heavy investment he has made, both of money and intellectual effort. To keep him unemployed or under-employed is therefore waste of national asset.

CURRENT MEDICAL LITERATURE

LYSIVANE IN PARKINSONISM

GILLHESPY (*Edinburgh M. J.*, **60**: 365, 1953) writes that lysivane has been given to a random sample of 100 Parkinson patients of all types of aetiology for at least three years. Successful results were only claimed when the relaxation of the rigidity and reduction of the tremors enabled them to return to more or less normal activity. Such successes were recorded in 68 out of 100 patients. Some of the remaining 32 became worse while others showed a little improvement.

Lysivane has certain distressing side-effects. Drowsiness, nausea, vomiting, difficulty in visual accommodation developed during the early days of treatment, whilst vertigo usually makes a later appearance after much larger doses have been given. Dryness of the mouth is always present. The toxic symptoms, except dryness of the mouth, can be controlled by adjustment in the dose and only once was it necessary to stop the drug.

Some of the Lysivane refractory patients responded later to another, or a combination of other anti-histamines. Frequency of favourable results with other drugs was in the following diminishing order: Artane; thephoran; phenergan; anthisan.

Taking into consideration the clinical, pathohistological and experimental pharmacological results, it is suggested that the favourable effect of the anti-histamines is due to the restoration of the balance between the mid-brain centres and the higher inhibition due to a selective action on the actetylcholine transmission of inhibitory and excitatory impulses.

Lysivane is the drug to which most of the patients suffering from Parkinsonism, regardless of the aetiology, respond most favourably.

BANTHINE IN PEPTIC ULCER

BECHGAARD AND OTHERS (*Am. J. Digest. Dis.*, **21**: 38, 1954) write that a series of 34 patients suffering from roentgenographically demonstrable chronic peptic ulcer, which had persisted for at least two years, was treated with Banthine, 50 mg. four times a day for one year. After the lapse of one year one-third of the patients were free from pain, and in one-fifth no ulcer could be demonstrated radiologically. Ten of the patientns had been subjected to operation. In another therapeutic experiment 134 ulcer patients were treated for three months, 68 with Banthine 50 mg. four times a day, and 66 with placebo. All were treated as out-patients after a stay of about three weeks in the hospital. Of those patients, treated with Banthine, 65 per cent were improved or cured clinically as compared with 56 per cent of those treated with the placebo. Radiologically the results were 23 per cent and 13 per cent cured, respectively.

It is concluded that Banthine has a symptomatic effect and may be a good supplement to the conventional ulcer therapy, but that Banthine alone exerts no distinct curative effect in peptic ulcer.

FAT SUPPLEMENTS IN CRITICALLY ILL PATIENTS

MINDRUM (*J. Clin. Nutrition*, **1**: 503, 1953) writes that when diets of constant amounts of protein and calories are administered the efficiency of energy utilization varies directly with the fat content and that if a protein content of the diet is maintained constant a negative nitrogen balance can be made positive merely by caloric supplementation. The author presents data observed during the administration of high caloric, high fat diets to 9 critically ill-patients, all exhibiting symptoms of protein depletion. The dietary supplements given consisted mainly of fat emulsions given by mouth or by stomach tube. The composition of the mixture was as follows: (1) edible oil (peanut, cocoanut or salad oil), 20 to 50 per cent by volume; (2) sucrose, 10 to 15 per cent by weight; (3) emulsifying agent, 20 per cent by volume; (4) flavor, vanilla extract, chocolate, coffee; (5) protein, powdered skim milk up to 23 per cent by weight; (6) water enough to make 100 c.c. In all nine patients marked improvement occurred as shown by sense of well-being, weight gain, increased resistance to infection and accelerated rate of wound healing. Although the selected patients mentioned above tolerated the mixture well, several others refused to take the emulsion. Moreover in a group of nurses who were attempting to gain weight such side reactions as anorexia, nausea and diarrhoea were noted in 30 per cent of this group. However, the author stressed on the importance of adequate caloric intake in the treatment of acute and chronic illness.

PROBLEMS IN FEEDING THE TUBERCULOUS PATIENT

GETZ (*J. Am. Dietetic A.*, **30**: 17, 1954) writes:

A tuberculous person has nutritive needs which the dietitian can help to meet by planning the menu to contain generous quantities of protein, vitamin A, and ascorbic acid. These have been shown to be specifically needed by the tuberculous person, the severity of the need being proportionate to the extent and the duration of the tuberculosis.

Vitamin A deficiency—Vitamin A deficiency, as evidenced by lower blood levels, is not as profound in the case of minimal tuberculosis. Night blindness, however, is almost always present. In advanced cases, the blood level of total vitamin A is always lowered. It exists in two forms in the blood—as the ester and as the uncombined alcohol. It is the latter that is lowered in tuberculosis. The amount of the ester of vitamin A in the blood may be the same or even a little higher. These low levels of vitamin A may be found in patients with a relatively high level of carotene (an average of 0·128 mg. per 100 ml.), indicating that the conversion of carotene to vitamin A is poor or completely blocked in tuberculosis. The vitamin A alcohol level may be precipitously low while there is vitamin A ester still available, indicating that in these patients there is a reduction in the release of vitamin A alcohol from the ester.

Protein deficiency.—The low serum albumin in the blood of tuberculous patients is often ignored because the total protein level in the blood stream approaches the normal level in most instances. The globulin fraction of the serum protein, particularly gamma globulin, is high because of the infection. In tuberculous patients, the low serum albumin level reflects a low protein intake as well as a retarded or failing support with protein released from protein reserves. This is not found in cases of minimal pulmonary tuberculosis unless the disease has been of long standing. It is found in almost all cases of advanced tuberculosis. A low albumin level, if prolonged, eventually means a low haemoglobin level and a low total red cell count with cells that have a normal color index.

Ascorbic acid deficiency—Acutely ill tuberculous patients destroy or cast off a great deal of ascorbic acid. Ascorbic acid is needed for the proper metabolism of amino acids,

specially tyrosine. Moreover it is a direct detoxifier actually effecting a chemical combination with toxic aggregates. Ascorbic acid has been found repeatedly in the urine of tuberculous patients in combination with various degradation products of proteins, presumably from toxic materials and destroyed tissues.

The diet, then, for the tuberculous patient need not be exceptional, except that it does contain more ascorbic acid and is quite generous in meat, milk, eggs, and butter. The diet should have enough calories to insure a weight gain. If a patient gains too much weight—that is, 10 per cent over standard weight the intake of carbohydrates is reduced.

NEEDLE BIOPSY AND INFRA-RED PHOTOGRAPHY IN CIRRHOSIS

JANKELSON AND OTHERS (*Am. J. Gastroenterol.*, **20**: 9, 1954) write that there is good correlation between the evidence obtained through an aspiration biopsy and infra-red photography in proven instances of cirrhosis of the liver. The liver biopsy permits of histologic study of living tissue. In cirrhosis of the liver it determines the degree of fibrosis, destruction and regeneration of liver cells, infiltration with fat, plasma cells, leucocytes or lymphocytes. The infra-red photographic evidence depends on the new anastomoses between the veins of the abdominal wall and indicates long-standing portal hypertension, more or less paralleling the amount of fibrous tissue within the liver. Cirrhosis, of short clinical duration, shows relatively little or no anastomotic veins.

A liver biopsy permits also the diagnosis of other liver diseases including biliary obstruction and, with some reservations the absence of liver disease. The photographic method is non-contributory except in cirrhosis of the liver. On the one hand liver biopsy requires hospitalization of the patient for 1 to 2 days, carries a calculated risk of hæmorrhage and bile peritonitis and is at times painful. Not infrequently, in cases where a needle liver biopsy is indicated, conditions exist which make this procedure inadvisable or hazardous. Infra-red photography on the other hand is not dangerous, is neither painful nor objectionable to the patient, and can be performed on ambulatory as well as hospitalized patients. The two methods are complementary in the diagnosis of cirrhosis of the liver. Further, by repeated liver aspirations, the progress of the disease can be followed and prognosis and proper evaluation of treatment can be made. Since infra-red photographic evidence depends on the formation of new anastomoses between the veins of the abdominal wall, this method gives no information as to regression of the disease. Progression of the disease may be accompanied by more arborations of the veins which, once formed, do not disappear even if portal hypertension is relieved.

Nevertheless, the simplicity and safety of the photographic method recommends it as a valuable procedure in the diagnosis of cirrhosis of the liver. It does not replace needle biopsy of the liver in the diagnosis of liver disease in general and of cirrhosis in particular. Both methods, judiciously and selectively applied aid in the diagnosis of cirrhosis of the liver.

WHITE NAILS IN HEPATIC CIRRHOSIS

TERRY (*Lancet*, **1**: 757, 1954) writes that opacity of the nail bed with apparent blanching of the nail is common. It was found in 82 out of 100 consecutive patients with cirrhosis hepatitis, and occasionally in certain other conditions.

White nails are easily overlooked. Fully developed white nails exhibit a ground-glass-like opacity of almost the entire nail bed. It extends from the base of the nail, where the lunula is indistinguishable, to within one or two millimetres of the distal border of the nail bed, leaving a distal zone of normal pink. The condition is bilaterally symmetrical, with a tendency to be more marked in the thumb and forefinger. In less "classical" examples the opacity varies widely in degree and distribution.

It is suggested that white nails are endocrine stigmata, comparable with spider naevi, palmar erythema, cutaneous striae, and gynæcomastia.

Well-developed white nails are apparently rare in healthy adults, and their detection may therefore be of some importance.

BLOOD DYSCRASIAS WITH CHLORAMPHENICOL

HODGKINSON (*Lancet*, **1**: 285, 1954) presents 28 cases of aplastic anæmia and 3 of granulocytopenia associated with the use of chloramphenicol.

In 24 of the 31 cases the dosage administered was in excess of, and the average was over double that of, a dosage calculated to be the maximum necessary to control most infections, and over four times that commonly used. In 2 further cases treatment was continued for over twenty four days, although the total amount given was not very high.

In view of the association of blood dyscrasias in this series with a prolonged high dosage of chloramphenicol it is recommended that, without careful consideration of the risks involved, the dosage schedule of this antibiotic should not exceed the following:

1. In adults a total dose of 26 g. (104 capsules).
2. In children the total dose should not exceed the equivalent of 100 mg. per kg. body-weight daily for seven days.
3. The length of treatment should not exceed ten days.

AUREOMYCIN PROCTITIS AND COLITIS

PALMER AND KIRSNER (*Gastroenterol.*, **28**: 44, 1953) report the occurrence of proctitis and colitis after the administration of chlortetracycline (Aureomycin) in five patients between the ages of 20 and 64 years. Two patients were given chlortetracyline for respiratory infections, one for suspected amoebiasis, one for a stitch abscess after ventral hernia repair, and one for dermatitis involving the hands. Healing of the ulcerative lesions of the colon and rectum occurred in four patients after periods of several weeks to months. The disease was so severe in the fifth patient that ileostomy had to be performed as a lifesaving emergency procedure; the mucosa remained inflamed and friable despite the ileostomy ond two separate weekly course of 0·5 gm. of corticotropin. Chlortetracycline thusu fay cause proctitis and colitis surpassing in importasce the original illness for which the antibiotic was prescribed. The incidence probably is greater than has been recognized. The mechanism of the process is not clear.

TREATMENT OF HODGKIN'S DISEASE AND THE LYMPHOSARCOMAS

MEYER (*J.A.M.A.*, **154**: 114, 1954) discusses the treatment of Hodgkin's disease and the lymphosarcomas under the following heads:

Irradiation—Roentgen irradiation is still unsurpassed for treatment in most cases of Hodgkin's disease, lymphosarcoma, reticulum cell sarcoma, and follicular lymphoblastoma. Follicular lymphoblastoma is the most sensitive of tumors to roentgen therapy.

High voltage therapy is usually employed and is directed to all detectable sites of disease. Treatment may be given daily or every second or third day, depending on the reaction of the patient to the therapy. To minimize x-ray sickness, which is not uncommon, usually a suppository containing 65 mg. of pentobarbital sodium is administered before the treatment and/or 50 to 100 mg. of dimenhydrinate (Dramamine) orally before and, if necessary, after therapy.

Roentgen irradiation has depressing effects upon the bone marrow, and the usual earliest sign of this is leukopenia. Hence, while the patient is undergoing therapy, especially if the doses are large, frequent leukocyte counts are made to avoid extreme leukopenia. It is an usual but not invariable policy to give one or more transfusions prior to roentgen therapy if the haemoglobin level is 50 per cent of normal or less and the erythrocyte count 2,500,000 or less.

Radium—Radium is now rarely used in the treatment of lymphomatous disease, because of greater likelihood of skin damage. It is also more difficult to use in treating any but sharply circumscribed lesions. With localized lesions it can be used effectively, however, but even then has no significant advantage over roentgen irradiation. The effects of radium and roentgen therapy upon the diseased tissue are, however, analogous.

Radioactive substances—Radioactive phosphorus, or p32 (half-life 14·3 days), alone has had extensive trial in the treatment of Hodgkin's disease, the lymphosarcomas, leukaemias, and polycythaemia rubra vera. It is especially effective in polycythaemia rubra vera and granulocytic leukaemia and rather disappointing in the treatment of the others. The unsatisfactory results in the latter might be due to the lack of localization of the radioactive phosphorus to the reticuloendothelial tissues after oral or intravenous administration, whereas there is a high degree of affinity for the myeloid tissues.

Nitrogen Mustard—The nitrogen mustards are leukotoxic, but this is not owing to the nitrogen mustards themselves but to the first ionization product, the ethylenimonium derivatives. The effects depend on inhibition of enzyme systems within the cell and mitoses, but other effects, too, are important. Nitrogen mustard is a white powder that rapidly loses its potency in solution; hence, when water is added, the material should be injected and not allowed to stand. As concentrated solutions are very damaging to veins producing pain with thrombophlebitis, it is customary to inject the solution (1 mg. per cubic centimeter) through the tubing of a solution of dextrose or saline solution (usually 250 c.c.) that is being administered intravenously. The dose is 0·1 mg. per kilogram of body weight and a course totals 0·4 to 0·6 mg. per kilogram, which is usually given over a period of 4 to 12 days. Since nausea and vomiting follow the administration of the drug in many of the patients the dose is usually administered at bedtime after giving the patient a sedative, usually a barbiturate, to minimize the period of discomfort. Nitrogen mustard is a valuable drug, particularly in Hodgkin's disease, but is less valuable in the lymphosarcomas and leukaemias. It is capable of producing subjective and objective benefits akin to those obtained with radiation therapy. It is most useful when there is widespread systemic disease or severe systemic intoxication in which radiation therapy might be hazardous or when the patient is no longer responsive to radiation therapy. There is some evidence that responsiveness to roentgen therapy may be occasionally restored following nitrogen mustard therapy.

The margin of safety in the use of nitrogen mustard is narrow, and serious toxic effects upon the bloodforming organs are to be guarded against. Leukopenia, granulocytopenia, thrombocytopenia, and anaemia are all serious potentialities. The maximum depressant effect of the drug is usually between the 10th and 20th day, and a second course of therapy should be avoided during this period. However, it has been a common practice to repeat a course when indicated after six weks. The remissions in repeated courses are often shorter than those initially achieved, and ultimately there is no response.

Nitrogen mustard and irradiation—Rose and his associates have combined nitrogen mustard therapy with irradiation by giving a single large dose of 0·3 mg. per kilogram of body weight for the systemic effects followed by a single large dose of irradiation of up to 600 to 1200 r, ideally 800 r, to a single local site. The effect was better in Hodgkin's disease than in lymphosarcoma or reticulum cell sarcoma. The results did not clearly indicate that the combined therapy was better, but there was an advantage in that the period of hospitalization was shortened. It was observed that the combination can be given with reasonable safety without excessive bone marrow damage if leukopenia does not exist prior to treatment.

Triethylene melamine—Triethylene melamine was found to have nitrogen mustard-like properties in animal experiments, and clinical studies demonstrated the effectiveness of this drug in Hodgkin's disease, lymphosarcoma, and leukemia. Triethylene melamine which can be given by mouth (although it may also be administered intravenously), less frequently produces nausea or vomiting, can be administered to outpatients with ease, and can be given to a patient persistently over periods of several months when the doses are properly spaced. The drug is highly toxic for blood-forming tissues and must be administered with proper circumspection.

5 mg. of the compound with no less than a half glass of water one to two hours before breakfast every other day for three doses. Daily leukocyte counts are made, and the dose may be further separated or omitted if leukopenia is marked, i.e., if the leukocyte count is below 3,000 in most cases or below 2,000 if there is a subnormal count prior to therapy. Then, after a two to three weeks interval, therapy is resumed, if the leukocyte count permits, with a dose of 5 mg. every week, or rarely twice a week, to 5 mg. every two weeks. It is wise to obtain a leukocyte count before each dose.

Although recognizing the great potential toxicity of triethylene melamine and the narrow range of safety, the author is very enthusiastic about this therapy in Hodgkin's disease, lymphocytic leukaemia, follicular lymphoblastoma, lymphosarcoma, and to a lesser degree, reticulum cell sarcoma arising in lymph nodes. It appears to be very helpful in some patients without having some of the real disadvantages of nitrogen mustard. Roentgen therapy is best when there is localized disease, as long as it is effective, but that triethylene melamine is the most suitable therapy we have to date for generalized systemic disease, and that, by produc-

tion of additional remissions after irradiation is ineffective, life is prolonged in many cases.

Corticotropin and Cortisone—Corticotropin (ACTH) and cortisone were also used for treatment of the lymphoblastomas. It appears that other available types of therapy generally are more effective than steroid hormone administration.

Surgical treatment—The employment of surgical methods for Hodgkin's disease and the lymphosarcomas has been advised for many years. In the early localized phase of Hodgkin's disease a wide excision of the nodes, followed by roentgen irradiation, was indicated.

Surgical treatment is useful in another occasionally observed situation, however, both in Hodgkin's disease and in leukaemia, i.e. when a complicating haemolytic process arises. When anaemia rapidly recurs in a case of this type and the reticulocyte count is high and the faecal urobilinogen output excessive, cortisone or corticotropin therapy may be tried and found effective. However, if this therapy fails, then splenectomy is indicated, and the results may be very satisfactory.

Miscellaneous measures—It is advisable to give blood transfusions when necessary. Antibiotics should also be administered for treatment of intercurrent infections or prophylactically when indicated in the treatment of any of the lymphoblastomas. Analgesics should be freely administered when required.

Simple measures for the improvement of the patient's general health are too often ignored.

Of real importance is maintenance of the morale of patients with these malignant diseases over the years.

Summary—Irradiation, triethylene melamine, and nitrogen mustard are usually the most effective therapeutic measures available for Hodgkin's disease, lymphosarcoma, follicular lymphoblastoma, and reticulum cell sarcoma. In most cases irradiation is the therapy of choice for all of them. Occasionally, with extensive systemic disease, nitrogen mustard or triethylene melamine, especially the latter, may be the therapy of choice in Hodgkin's disease; and, generally speaking, these compounds are more effective in the treatment of Hodgkin's disease than in any of the others. Follicular lymphoblastoma is ordinarily more responsive to roentgen therapy than the other three, and the prognosis is usually better. In the average case reticulum cell sarcoma tends to be most resistant, and the prognosis the poorest, with an average duration of life about two years or less. Important adjuvants in the treatment of these patients include a high calory, well-balanced diet, administration of iron, transfusions as necessary, antibiotics at times, occasionally certain surgical measures, and the maintenance of a good morale bf permitting reasonable activity during asymptomatic phases and by avoiding a pessimistic attitude and an ominous or specific prognosis.

VITAMIN B_{12} IN TRIGEMINAL NEURALGIA

SURTEES AND OTHERS (*Lancet*, **1**: 430, 1954) report on the treatment with massive dosage of vitamin B_{12} in 18 cases of trigeminal neuralgia and 1 case of glossopharyngeal neuralgia.

Considerable symptomatic improvement took place in fifteen of these cases after treatment, it seems likely that the higher dosage of 1000 μg. daily for 10 days followed by five injections of 1000 μg. twice weekly is more suitable for the average case. It also seems likely that maintenance therapy will be required in most cases, although the amount of vitamin B_{12} necessary will probably vary a good deal from case to case.

The results suggest that vitamin B_{12} used in this dosage can produce a remission which may be continued for a long time; but there is no evidence that this treatment will permanently cure trigeminal neuralgia.

CONTROL OF VOMITING IN CHOLERA

CHATTERJEE (*Lancet*, **2**: 1063, 1953) writes that vomiting in cholera leads to dehydration and shock. In 59 cases in the 1952 epidemic and in 127 cases in the 1953 epidemic vomiting was treated with avomine. Of these 186 cases 33 were mild and 153 moderately severe. All these patients recovered.

Avomine stops the vomiting, but not the diarrhoea. Fluid replacement by the oral route thereafter may be easier.

ADRENOCORTICAL FUNCTION IN BURNED PATIENTS

SEVITT (*Brit. M. J.*, **1**: 541, 1954) from an analysis of a study on the adrenocortical activity in 54 burned patients in the Birmingham Burn Units based largely on the spontaneous changes in the eosinophil count found after burning and in 21 of the patients upon the changes induced by test dose of A.C.T.H. or adrenaline observes that adrenocortical hyperactivity always occurs after significant burning. In 49 out of the 54 patients there was no evidence of subsequent adrenocortical failure, and these included 16 of the 18 patients who died.

In five patients, two of whom died, there was evidence of adrenocortical failure. In one a "premature" rise in the eosinophil count after burning was associated with clinical deterioration, and death soon occurred.

Twelve of the 14 patients tested with A.C.T.H. gave normal eosinophil depression curves, indicating normal stimulable reserves of the adrenal cortex. However, eosinopenia was not induced in a young girl tested on the fifth day after burning, suggesting that adrenocortical failure was present; but the spontaneous eosinopenia developing a few days later indicated that, if failure had occurred earlier, it was of short duration. She died 15 days after burning. In another child, not unduly ill, several abnormal reactions to A.C.T.H. were found within 10 days of burning, but on the sixteenth day the test was normal. She survived.

In nine out of twelve patients tested with adrenaline, normal eosinophil depression curves were obtained. The abnormal results found in two children indicated adrenocortical failure at the hypothalamic-pituitary level, since the A.C.T.H. tests were normal. The children were confused and irrational at the times of the abnormal reactions, but later, when normal adrenaline reactions were found, mental recovery had taken or was taking place. It is suggested that both the mental disturbance after burning and the persistence of circulating eosinophils after adrenaline were due to similar changes affecting the cerebral cortex and hypothalamus respectively.

CURRENT TOPICS

THE MEDICAL PROFESSION TODAY*

F. G.,

(Member, House of the People).

High Investments and Low Returns

Walk around the chemist's shops, and you will find some of them having a doctor attached. He examines patients and prescribes drugs which are, naturally, bought on the spot. You would form the shrewd suspicion that the doctor gets a kick-back on the value of his prescriptions.

Now this is a practice thoroughly repugnant to medical ethics, since it encourages the doctor to prescribe more drugs than the patient really needs.

Not all doctors who practise at chemist's shops are guilty of drugging their patients just for the profit of it. There are honourable exceptions. A doctor may set up part-time practice at a medicine store for the advantages of its convenient location for his clients, and refrain from excessive medication.

But why are some doctors driven at all to this undesirable practice?

In 1952 the Burmese Government, finding itself short of doctors, wanted to recruit some from India with the co-operation of the Indian Government. The salary offered was Rs. 425 per month in the case of three-year contracts, and Rs. 475 per month for five-year contracts, with the cost of living allowance admissible to Burmese Civil Servants of the same grade.

The number of Indian doctors who applied for recruitment under this scheme greatly exceeded the number actually selected.

Considering that our own country is far from being surplus in doctors—60,000 for a population of 360,000,000—how did this happen?

Again, some of the most unlikely people among doctors cherish a secret desire to join the Army. Home-loving men on whom the uniform would sit oddly, they rarely summon enough resolution to take the plunge. But a large number of them keep flirting with the idea. Since it is not a love of adventure and travel, what moves them to think in terms of Army service?

Meagre Returns—The altogether meagre returns from the private practice are the explanation in each case.

One is not speaking here of the few leading practitioners and specialists in each city who have quite an affluent income. They form a tiny minority of the medical profession. Their fee for a consultation may be anything above Rs. 10/-. The middle and lower-income groups who form the bulk of the average doctor's clientele are either unwilling or unable, or half and half of both, to pay any consultation fee at all.

The doctor perforce resorts to one expedient or other for sheer survival. Either it is collusion with a chemist's shop, or the waiving of consultation fee (which the patient always regards as excessive if not quite gratuitous) and the liberal use of injections (a mysterious operation for which the laymen does not grudge a few rupees).

The mantle of the priest, it is said, has in the modern world fallen on the doctor. We go to him with our troubles. But the average doctor is no more made of the stuff of martyrs than you or I. He wants to live in reasonable comfort, give his chidren an education, and help maintain the inevitable dependants.

If he is not honoured at home, he is willing to go abroad. He is in the same predicament as the Indian youth with specialist qualifications in engineering, economics or science who would much prefer to serve the Indian Government or an Indian firm, but is offered such low rewards that he joins a foreign establishment.

The Army's attraction is the same. It offers a salary of Rs. 350 on commission, plus allowance and other benefits.

This seems quite a lot for the average doctor in our towns and cities. Let us ignore for the moment his food bill, and that of his wife and children. Merely to function with normal efficiency, the general practitioner needs to have a house with a consulting room, a car or a motor cycle for visits, and a monthly stock of medicines and equipment. Placing house rent at Rs. 75, transport maintenance at another Rs. 75 and the monthly recoverable outlay on medicines at Rs. 100, he thus needs a minimum of Rs. 250 just to carry on his professional work.

Very few of them earn Rs. 150—not to speak of the extra costs of food and children's education—from consultation fees which are the only proper mode of remuneration. Since patients regard fees for consultation as something given away for nothing, the doctor necessarily converts himself into a tradesman by opening his own dispensary. He charges more than the cost price for drugs, and since the margin on any single transaction cannot be significant, may drug the patient unnecessarily.

From the high status of a specialist in the alleviation of human suffering, the doctor is thus reduced to a vendor.

Shocking Conditions—The low returns offered by the medical profession today are the more shocking when considered in relation to the high investment which goes into the making of doctor.

It takes greater expenditure of time, money and intellectual effort to become a doctor than to train oneself for most other profession—certainly not less than it takes to enter the coveted Administrative or Foreign Services.

Even to gain the opportunity of training in a medical college is harder than admission to institutions training young people for other professions. Any student who has passed the Intermediate examination of an Indian university can have admission to the degree and most honours courses for the asking. But he must have proved exceptionally good indeed in his science subjects if he wants to take up medicine or engineering.

Having gained admission, the medical student must spend more on books than most others. To take only a few of the "musts" among text-books: the current price of Gray's Anatomy is Rs. 55; Price's Text-Book of Medicine is Rs. 35; and the Text-book of Surgery by Handfield Jones Rs. 33.

The period of training is longer than for students of most other disciplines. The duration of the M.B.B.S. course

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* Reprinted from a series of articles by F. G., Member, House of the People, in *The Indian Express* of March 29, 30 and 31, 1954.

is nearly five years, but the annual examinations are so rigorous that the great majority of students take an additional six months to a year before they finally qualify.

Doctors are too few, yet too many—Hardly a single speech by Rajkumari Amrit Kaur, Union Health Minister, is without a lament over the inadequacy of doctors. The Prime Minister, inaugurating a hospital in Travancore-Cochin last month, said: 'We are so terribly short of qualified doctors that one does not see how long it will take to have more personnel."

Statistics on this subject are as depressing as they are eloquent. The number of doctors in the country today—counting only those who are graduates or licenciates in modern medicine and not the mostly self-styled Vaids, Hakims, and Homoeopaths who are legion—is about 60,000. The country's population being 36 crores according to the latest census, we are left with the figure of one doctor for every 6,000 of the population. This compares with one doctor for every thousand in the United Kingdom.

Clearly one of the country's greatest needs is to increase the supply of trained doctors. The low levels of health and of life expectation in the country urgently demand this.

Here, again, statistics are doleful. The chapter on health in the Five-Year Plan, quoting an estimate based on data relating to 1941, places the expectation of life in India at 32 for males and 31 females. The 1951 census estimates the average expectation of life at age 10 to be 39 the difference being explained by the very high rate of infant mortality in our country.

Even taking for purposes of comparison the higher expectation of life at age 10, corresponding figures for other countries are 59 to 60 in the U.K., Australia and New Zealand; 50 in Japan; 47 in Egypt; and 56 in the U.S. (this is the figure given in the 1951 census report, though President Eisenhower in a recent speech has claimed that the average U. S. life-span is now 68).

Mr. R. A. Gopalaswami, Census Commissioner, observes: "We continue to have the unpleasant distinction of having the lowest expection of life among all the peoples for whom figures are available."

The Health Atlas of India for 1953 brought out by the Union Health Ministry compares the death rate in India with that of 21 other countries, not all of which are economically much more developed than India. Only Egypt, among these 21 countries, has a death rate exceeding ours. The rate in Spain, Italy, Ireland, Japan and Ceylon—not to mention Britain and the U.S.— is less than that in India.

What are the implications of the low level of health indicated by these figures? "Health", says the Five-Year Plan, "is fundamental to national progress in any sphere. In terms of resource for economic development, nothing can be considered of higher importance than the health of the people, which is a measure of their energy and capacity as well as the potential of man-hours for productive work in relation to the total number of persons maintained by the nation. For the efficiency of industry and of agriculture the health of the worker is an essential condition."

It is true that many factors go into the maintenance of health which are not within the power of a doctor to supply such as hygiene environment, nourishing food and safe water. But lack of medical care, curative and preventive, is one of the principal factors making for the excessive incidence of illness and death among our people.

The Five-Year Plan has, therefore, provided for a steady increase in the number of medical colleges, their output of doctors and of hospitals.

What is the target to be aimed at? Reporting in 1946, the Health Survey and Development Committee (popularly known as the Bhore Committee) recommended an increase from the then available number of doctors, 47,500, to 185,000 over a period of 25 years. The committee explained: "we have given existing standards (of the doctor-to-population ratio) in the U.K., but have suggested for India a lower ratio as the target to be aimed at during the next quarter of a century. The reason is that the available number is so small that even the attainment of the suggested ratio by 1971 will involve concerted, intensive and unremitting effort, on an unprecedented scale, by the authorities concerned."

The Five-Year Plan target is even more modest than that of the Bhore Committee. The plan provides for an increase in the annual output of doctors from 2,504 in 1950-51 to 2,782 in 1955-56. At this rate of an 11 per cent increase over a five-year period, it will take nearly 37 years to reach the target of 185,000 doctors.

Clearly, then, the trained doctor is a scarce commodity in India today, and will continue to be so far a good many years to come. By the familiar law of supply and demand, doctors should therefore be a highly valued and highly paid sector of the community, practically in a position to dictate the terms for the specialised service which they alone can render. But they are not, as we have already seen.

The reason is that though doctors trained in scientific medicine are a few, the number of those who practise the healing art is enormous. Some of them have a semblance of the requisite knowledge and training, but most have no qualification whatsoever.

Such are the compounders turned amateur doctors, the retired Government servants who set up as Homoeopaths, and the genuine of self-styled Vaids, Hakims and Naturopaths.,

Their number has never been accurately assessed, and the task is nearly impossible. But an estimate made in respect of one category, the Homoeopaths, by the Homoeopathic Enquiry Committee places their number at 300,000—five times as many as those trained in modern scientific medicine. The others must add up to at least another 300,000.

Thus, though we have only one scientifically trained doctor for every 6,000 of the population there is at least one medical practitioner for every 600. We therefore see in operation not the law of scarce supplies and dear prices, but the other economic truism that surplus availability of an article depresses its value.

. . . "His success depends on his luck and pluch
. . . . . luch in finding somebody to pluch

Scientists Swamped by Amateurs and Quacks

There are certain minimum qualifications prescribed for recognised professions such as law, accountancy and teaching. But, save in two States there is nothing in India to prevent anyone from setting up as a healer of disease.

Anybody can assume the title of 'doctor'. No action has yet been taken on the Bhore Committee's recommendation

that legislation should be passed to prohibit use of the title except by those who graduate from a medical school or college and those on whom a doctorate has been conferred by a University.

The result is that the treatment of sick persons is now carried on by two classes of individuals; about 60,000 degree-holders and licentiates who possess registrable qualifications in modern medicine and an uncomputed but much vaster number who are not trained and are not qualified.

"It is part of the democratic conception", says the Bhore Committee's report, "that the individual citizen has the absolute right to take his ailments to anybody he chooses, but it is also part of the individual citizen's right that he should have an exact comprehension of the pretensions to competence of the individual he employs".

In the absence of compulsory registration on the basis of prescribed qualifications and training, the citizen has nothing to guide him, except hearsay and superstition, in his choice of a doctor. Bombay and Travancore-Cochin are the only States which have attempted to make registration compulsory for all persons practising any form of medicine. Since, however, the registration is on the basis of so many years' practice and not a uniform course of prescribed study, the value of the action taken in these two States is very limited.

The role of the indigenous system of medicine in the country's health services is admittedly a controversial question, dispassionate consideration of which is hampered by an emotional identification of modern scientific medicine as a foreign, more particularly 'Western' import associated with British domination.

Indigenous System—Treatment by the practitioners of the indigenous systems is offered relatively cheap, and they claim to have inherited empirical knowledge, accumulated over centuries, about the properties and medicinal uses of minerals, herbs and plants. The undoubted part which these systems played in the long distant past in influencing the development of medicine and surgery in other countries of the world has naturally engendered a feeling of patriotic pride.

Approaching the question with extreme caution, the Bhore Committee said: "We do not propose to venture into any discussion in regard to the place of these systems in organised State medical relief in this country. We do, however, say quite definitely that there are certain aspects of health protection which can be secured wholly or at any rate largely, only through the scientific system of medicine. Thus public health or preventive medicine, which must play an essential part in the future of medical organisation is not within the purview of the indigenous systems of medical treatment as they obtain at present.

"It has also to be recognised frankly that the indigenous systems of medicine do not at present deal with such vital aspects as obstetrics, gynaecology, advanced surgery and some of the specialities. Above all it is necessary that we keep prominently before our eyes the intimate relation between science and the advancement of medicine. No system of medical treatment which is static in conception and practice, and does not keep pace with the discoveries and researches of scientific workers the world over, can hope to give the best available ministration to those who seek its aid.

The weakness of the indigenous systems is demonstrated by nothing more striking than by the scale on which the practitioners of these systems resort to the use of Western drugs. In Bombay, where trained ayurvedists have been posted to so-called ayurvedic dispensaries, it is found that the bulk of the indents are for modern, not ayurvedic, drugs. Similarly in institutions where ayurveda is supposed to be taught, as in Bombay's Poddar Medical College and the Indian Medical School at Madras or the Ayurvedic Medical School at Jamnagar, the major part of the curriculum is devoted to modern science and modern medicine.

The organised medical profession therefore asks that the claims of homoeopathy, ayurveda and unani be submitted to the test of practical application, instead of these systems being nurtured as mysteries.

The demand would seem to be reasonable, considering that two evils follow when indigenous practitioners, with only a smattering of modern medical knowledge, attempt to practise modern medicine: in the first place the people's health is endangered and secondly, the properly trained doctor is overwhelmingly outnumbered and deprived of his living by amateurs.

The views of the profession were well set out by Dr. S. C. Sen in his presidential address to the 30th All-India Medical Conference at Hyderabad last December. "From researches carried on by individuals," Dr. Sen said, "we get glimpses of notable performances made by Ayurvedic physicians in the past in the fields of surgery and obstetrics, for which I feel proud, along with my countrymen. But the fact remains that, in its present static state, Ayurveda means no more than medication by certain drugs, some good and some not so good. It has thus become extremely limited in its scope of service.

"To try to revive Ayurveda, as it is, and to give it artificial props would be futile. What would be more sensible approach is for doctors of modern medicine, who possess sufficient knowledge of Sanskrit, to take up the study of Ayurveda and to practise it whenever feasible. I would go even further and plead for the establishment of post-graduate courses in Ayurvedic medicine, and for the inclusion of a compulsory course in this subject for undergraduate medical students as well. This, in my opinion, is preferable to starting separate Ayurvedic colleges and instituting Ayurvedic diplomas and degrees, and will be immeasurably more economical."

The rational approach, however, does not easily prevail against vested interests and political pressure. At the second meeting of the Central Health Council in Rajkot last month, the assembled Health Ministers from the different States decided in their wisdom to recommend the institution of five-year degree courses in Ayurveda, Unani and Homoeopathy.

It is not difficult to imagine what will happen if this recommendation is acted on. Undergraduates who cannot by merit gain entry into the colleges of modern medicine will flock to these new colleges, acquire a degree in one of the indigenous systems of medicines, and practise modern medicine in effective competition with the scientifically trained doctor.

A premium would thus be placed on pseudo-knowledge of medicine, and a penalty on true scientific knowledge. In the bargain, it is the people's health that will be jeopardised.

Crowding and Competition—If the doctor fights a losing battle against competition from outside the scientifically trained profession, by amateurs and quacks, competition

from within is no less serious. It is the second major cause of the doctor's poor economic status.

This internal competition has two aspects, and the less important the competition between licenciates and degree-holders—may be briefly discussed first.

The relationship of the licenciate and the degree-holder is radically different from the situation of the modern doctor vis-a-vis practitioners of indigenous systems. Both the licenciate and the degree-holder are trained in modern scientific medicine; it is only that the former, with matriculation as the minimum qualification enter a medical school for a four-year course, whereas the latter, with Intermediate (Science) as the minimum background, undertake a specialised five-year course in a medical college.

Uniform Class—The battle for a single uniform class of doctors has been largely won, most State Governments having accepted since the 'thirties that medical schools producing licenciates should either be closed down or upgraded into colleges. The process was almost completed during 1948-50, and there are now only two medical schools left in the country.

In her address to the recent Rajkot session of the Central Health Council, Rajkumari Amrit Kaur appealed to the two State Governments which are still allowing the licenciate course to upgrade the institutions into colleges, and sounded a warning on a related matter. This is the tendency of some State Governments to permit auxiliary health personnel to set up as medical practitioners.

The Madhya Pradesh Government, a few years ago, started an institution for training auxiliaries. Matriculates were given three years' medical training on the strict condition that they would work for a minimum of five years in rural areas, not as medical practitioners in their own right but as auxiliaries under the control and supervision of a qualified doctor.

But soon the students went on strike, demanding a higher status. The State Legislature thereupon enacted a law enabling these matriculate-trainees, after three years' work in rural areas, to get themselves enrolled in the State Medical Register as practitioners.

The Central Health Ministry's similar scheme for the training of auxiliary health personnel, which was approved in principle at Rajkot, carries the danger of repeating the Madhya Pradesh debacle on a nationwide scale.

Rajkumari Amrit Kaur herself drew pointed attention to this danger. She told the Health Council: "It is not inconceivable that, when this auxiliary service has grown in numerical strength, considerable pressure willl be brought on State Governments either to give them recognition as doctors or to enable them, with some short course of fresh training to enrol themselves as doctors. In either case hasty decisions taken by individuaul State Governments to give them such recognition would prove most unfortunate.

"The whole background of training designed for them to-day is such as to mark them off as distinct from doctors and to prevent them from taking on the role of doctors. But quackery is so rampant in our country that to ignore future possibilities of undesirable developments would be unwise on our part. An Association of Compounders, who are freely practising as doctors, seriously put forward some time back the plea that their right to practise should be recognised, that they should be registered and that they should be given the right to prescribe those medicines which are now permitted to be prescribed only by registered practitioners."

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While the danger inherent in the proposed system of auxiliaries is great, the doctor's present trouble is not so much from this quarter (though many a compounder has already displaced the doctor in routine drug prescription and injections. His trouble arises primarily from competition among qualified doctors themselves.

Of the 60,000 doctors we have, 75 per cent are concentrated in our towns and cities though, according to the latest census, our urban population is only 17·13 per cent of the total.

The grossly unbalanced distribution of doctors between the urban and rural areas has two-fold effect: it reduces the availability of expert medical aid for the rural population, and makes competition among urban doctors so keen that they have to undercut each other in order to survive at steadily diminishing levels of income.

Who or what is to blame for this concentration in cities and towns which is as bad for the doctor as it is for the country's health standards?

It is easy to blame it on the doctor himself. An idyllic picture can be drawn of the town-bred, town-educated doctor opting to settle down and practise in the countryside, respected by villagers as a leading citizen and drawing a stable even if moderate income. In this view, it is the doctor's own fault if he is foolish enough to enter the already crowded urban market.

This idyllic picture, however, overlooks a few details. How many villagers will be able or willing to pay our happy rural doctor Rs. 5, or even Rs. 2, for a visit involving a journey of three or four miles? Doctor would more likely be offered profuse thanks, pan and a cocoanut.

Again, where would the rural doctor send his children for schooling beyond the elementary stage? If to the nearest town or city, how will he maintain them and finance their holiday visits home, without adequate cash income?

How, in the present state of rural communications, will he move about from village to village to visit patients? The doctor is not a peculiar species gravitating round urban centres. He is attracted to the city for the identical reasons which draw all educated people to the city. Being human, the doctor likes urban amenities, and needs the educational and other facilities which the cities alone provide.

What, then, is the solution for this problem of crowding and competition in the cities?

The State's Role in National Health

To compel the doctor to work in rural areas is a tempting solution, but it cannot be put through in a democratic society which does not employ totalitarian methods of labour direction.

It is a sign of the prevailing lack of fundamental thinking on the subject of rural medical aid that, despite the dismal failure of the Fyzabad scheme by which the Uttar Pradesh Government sought to make constructive rural work compulsory for the award of University degrees, the Prime Minister should have suggested a similar experiment with medical students.

Opening a hospital in Travancore-Cochin during his recent tour of that State, Mr. Nehru said: "I think the Government of India has made a rule now or is going to make it—I hope it does—whereby no doctor will be engaged in Government service if he has not served for a year a village or some outlying village. Only then they will be qualified to enter Government service."

Apart from the harshness of imposing an additional requirement on the medical student who already has to put in seven years at the University and an additional year of hospital internship before he can start on his career, the proposal is peculiarly inept for the intended purpose of providing increased health facilities in rural areas. The aim, surely, is not to give a few villagers the benefit of attendance by an annually changing young doctor who has no intention of settling in their midst but is itching to get away and get started on his regular career.

The only way of furnishing a proper health service for our rural population is for the State to engage an adequate number of doctors and post them in the countryside. There is no alternative short-cut.

The proposal to make prior rural work obligatory for Government employment might conceivably work if the rewards offered by the State medical services were attractive enough. The salaries actually offered to-day are less than fair not to speak of their being compellingly attractive.

In Bombay, which is a 'model State' in spending the most on health, the medical graduate recruited to the Medical Service (Class II) serves a probationary period of two years on Rs. 200 per month, moving to Rs. 220 on confirmation with annual increments of Rs. 15. The scale ends at Rs. 650, after two efficiency bars.

The position in other States is even worse for the Government doctor. The Madras medical service offers the graduate entrant a basic salary of Rs. 200. What are the prospects he can look forward to? The allurement of a Rs. 25 increment every two years, reaching the pinnacle of the scale at Rs. 400.

Assistant Surgeons in Madhya Pradesh start on Rs. 225, on an increment scale which reaches the maximum of Rs. 600 after two efficiency bars.

In Delhi, the scale is Rs. 260-15-440-20-550. In Saurashtra it begins with Rs. 185 and rises to a maximum of Rs. 500.

Apart from dearness and house rent allowances as for all other Government employees, the only additional income for Government doctors is the non-practice allowance, which ranges from 25 per cent of the salary in Delhi to slightly more or less in other States. The salaries being what they are, this compensation in lieu of private practice does not exceed Rs. 60 for the new entrant.

Not until the salaries offered by the State medical services are made as attractive as the Indian Administrative Service scale will Government service become a prized objective for the doctor.

Basic Salary—This is just what the Indian Medical Association has urged. Pointing out that "medical men have to work harder than people in other services, being on call for 24 hours of the day and night without any extra reward", the Association has recommended that the basic salary for the doctor should be on the same grade as the I. A. S. officer: Rs. 350 at the start, rising to a maximum of Rs. 950.

The offer of such an incentive must precede the enforcement of rural work as a qualification for Government service if it is really hoped to induce doctors to practise in the countryside.

It is to the credit of the West Bengal Government that they have realised the need for attracting doctors to rural areas by offering the requisite incentive. Doctors in the State's medical service are offered an extra pay of Rs. 100 if they opt for service in rural areas. They can ask for a transfer back to an urban centre only after five years, and will then forego the extra pay.

West Bengal is again the only State to have rejected the idea of training auxiliary health personnel, with all the attendant risks which have been discussed. It has refused to treat the rural population as deserving of only second-rate medical attention.

The reason why West Bengal's example is not being followed by other States is not shortage of personnel but failure of policy, because only 15 per cent of the 60,000 doctors in the country are now employed by the State.

The conclusion cannot be avoided that the State has failed so far to accept and fulfil its responsibility for the health—consequently also the happiness and productive capabilities—of the 360 million of our people.

It is only with accelerated economic development that the citizen's ability to pay for medical attention, and the State's ability to provide it for him, can increase to any significant degree.

But if a national health insurance scheme is beyond the capacity of the State in India today- it does not follow that it cannot assume greater responsibility for the people's health than it does now.

Health for the Millions—Short of launching a national health insurance scheme to cover every citizen, which is ruled out by the shortage both of finance and of personnel, what can the State do to provide better medical aid for the millions?

A first and obvious step would be to utilise existing personnel. Only 15 per cent of the available doctors are now employed by the different State Governments, while the rest, crowded in the cities, compete hopelessly with each other and with an army of amateur and quack practitioners.

"Taking into consideration the need for ensuring adequate health service for the vast rural population of the country and the difficulty experienced in the past in attracting medical practitioners to the countryside," the Bhore Committee said, "we have come to the conclusion that the most satisfactory method of meeting the situation would be to provide a whole-time salaried service which would enable Governments to ensure that doctors are made available where their services are most needed. This conclusion is supported by the evidence of a number of representatives of the medical associations, of private individuals and several medical administrators."

This eight-year-old recommendation can be acted upon by State Governments without incurring any crippling financial burden.

Secondly, protection of the people's health demands that quacks be driven out of the medical profession. The right to practise medicine should be limited to those who are qualified to do so. In most advanced countries, the qualification required is the possession of a degree in modern

scientific medicine. In the special circumstances of our country, where Health Ministers are unable to resist the political pressure from practitioners of Ayurveda, Unani and Homoeopathy, the qualification might be extended to the possession of a degree in any of these systems. But all others must be firmly barred from playing with people's lives.

Steps against Quackery—There are many ways of ensuring against quackery. One would be to lay down that a death certificate will be valid only if it is signed by a registered medical practitioner. Another is the restriction of the right to prescribe certain drugs. Such a restriction already exists on paper. Drugs specified in Schedule H of the Indian Drugs Act can be supplied in retail only against a prescription from a registered practitioner. But only some State Government like West Bengal and Orissa have been enforcing this rule, while many have allowed concessions permitting unregistered practitioners of indigenous systems to prescribe these toxic drugs.

The third important step towards raising the health standards of our millions is to provide health insurance for certain limited but quite numerous sections of the population.

This approach will permit a system of national health insurance to be built upu by gradual stages, as resources in money and personnel become increasingly available to the Government as the result of planning.

It also enables a discriminating choice of the categories of people who are to be benefited by health insurance. Obviously the wealthy and upper-middle classes do not need it, being themselves in a position to pay fully for medical attention. While the needs of all the poor and the lower-middle classes, constituting the greater majority of the population, cannot be met all at once, large groups of them can well be brought under health insurance immediately without any undue strain on resources. What is required is the will to take suitable action.

Health Insurance—The only attempt that has been made in the direction of health insurance so far is the Employee's State Insurance Scheme, for which the Constituent Assembly (Legislative) passed a law in April 1948.

But implementation of this scheme has been extremely slow, and did not start till February 1952. An important reason for the delay was the objection raised by the Employers' Association of Northern India, supported by the Uttar Pradesh Government, that the contemplated implemention of the scheme in Kanpur and Delhi, without simultaneous implementation in other industrial centres, would result in a competitive handicap to industry in these two cities.

A Bill to amend the original Act was passed by Parliament in October 1951, providing for the payment of contributions by industrial employers all over the country though the scheme was not to be implemented at once in all industrial centres.

Between February '52 and August '53, 150,000 workers in Delhi, Kanpur and seven industrial towns of Punjab were brought under the health insurance scheme. This is a far cry from the target of two million workers who are intended to be given the benefit of health insurance, and from whose 12,000 employers the contribution is already being collected.

While every effort should be made to achieve the aim of enforcing the employees' health insurance scheme during this year in all towns having an industrial concentration of 5,000 workers or more, the Government should plan right now for the extension of health insurance to categories of people other than industrial workers.

A possibility that at once occurs to mind is the extension of the scheme to cover not only the industrial worker but his family as well. This would increase the number of beneficiaries from two million to about eight million. The cost involved in providing medical aid, including hospital facilities, to such a large number will doubtless be heavy but cannot be avoided by a Welfare State.

The only category of employees other than industrial workers who now enjoy guaranteed medical aid are Government servants, though not all of them. Rajkumari Amrit Kaur's scheme for extending medical aid to the low paid Class IV employees of the Central Government residing in Delhi and New Delhi is an imaginative gesture. State Governments could usefully follow the example set by the Union Health Minister.

Already Dr. Sushila Nayyar, Health Minister of Delhi State, has in co-operation with the Delhi Medical Association prepared a scheme of comprehensive health service for employees of the State Government. It has the added advantage of giving freedom of choice for patients and doctors, by operating through a panel of private practitioners rather than a whole-time salaried staff.

There are, however, other sections of the community who deserve similar attention and for whom it is practicable to provide health insurance. Such are the employees of commercial establishments, teachers and students.

School medical services are an important part of the health system in Britain where, immediately before the last war, there were nearly 2,500 school clinics (roughly one per 2,000 children). The regulations governing grants to schools make it obligatory for local education authorities to provide for treatment of defects of eyes and teeth, minor ailments, enlarged tonsils and adenoids. Since healthy children make for tomorrow's healthy citizens, there is no reason why similar responsibilities should not be placed on educational authorities in our country.

Community Project areas and extension service blocks offer another field for gradual introduction of health insurance.

Admittedly, with the greatly varying degrees of ability among the beneficiaries to contribute to the cost of the scheme, and their dispersal over a wide area, the expense will be greater than in urban schemes. But there can be no valid objection to the collection of a levy from persons who hire agricultural labour, on the lines of the employers' contribution under the industrial workers' health insurance scheme. The employees' share, however, will have to be graduated according to ability to pay, and a great number of landless workers will have to be exempted from any payment. The State's contribution from general revenues will have to be correspondingly large. But the health of our rural population has been so long neglected that to subsidise it heavily at this stage will be bare justice.

Apart from the few whole-time salaried doctors, the private practitioner who acts as "panel doctor" is the pivot on which any health insurance scheme rests. He is, whether a specialist or general practitioner, assigned a certain number of insured persons and is paid so much per capita. Provided a fair capitation fee is fixed, health insurance can be

a boon not only to the insured persons but equally to our struggling doctors.

This is evident from the experience in Britain, where the great majority of specialists and between 90 and 95 per cent of general practitioners are taking part in the national health Service. In England and Wales alone, between 18,000 and 19,000 of the total of 21,000 general practitioners are participating in the service.

Besides direct employment by the Government, urged earlier in this article for extending medical facilities in rural areas, health insurance is the best means of providing full employment and fair wages to the doctor.

We have already seen that the qualified doctor today is neither fully employed nor does he get fair returns on the heavy investment he has made, both of money and intellectual effort, in qualifying himself to be a doctor.

Unlike the civil servant or the teacher or the bank official whose work contributes only indirectly to the national good, the doctor through his daily work instantly and tangibly helps to raise health standards.

To keep him under-employed is, therefore, to waste a national asset. Our State, which is enjoined by the Constitution as a directive principle of policy to regard "the improvement of public health as among its primary duties", should not tolerate such waste.

The foregoing articles have surveyed the reasons why there is today no effective demand for the services of qualified doctors, few as they are.

It is the duty of a Welfare State to create the demand, and utilise the services of doctors to the full for the promotion of national health.

I.M.A. PRESIDENT'S TOURS IN GUJARAT & SAURASHTRA

Dr. S. C. Sen, President Indian Medical Association arrived at Bhavnagar by air in the morning of 7-2-54 and was received by Major C. P. Bhatt, President, Gujarat and Saurashtra Provincial Branch and the President and members of the Bhavnagar Branch, I.M.A. During morning hours he visited the Government Hospital and later had lunch with the Managing Committee. In the afternoon he visited the T. B. Sanitarium and Hospital at Songadh about 35 miles from Bhavnagar. On his return he had tea with the President and members of Bhavnagar-Para Branch and lastly a grand dinner with the members of the Bhavnagar Branch. Dr. Sen spoke on the aims and objects of the Indian Medical Association and appealed to the members to strengthen their rank and file and asked them to contact the public at large and explain to them the objects for which the Indian Medical Association stood. Dr. Sen left for Rajkot on 8-2-54 by morning plane reaching Rajkot at 10-30 a.m., where he was cordially received by the President and members of the Rajkot Branch. A special reception and dinner was arranged by the Rajkot Branch to meet Dr. Sen on the evening of the 9th Feb., 1954 which was also attended by Dr. A. D. Mukharji, Dr. P. V. Benjamin and Dr. Albuquerk of E. S. I. Corporation. Dr. Sen appreciated the services of the Rajkot Branch for the Anti T. B. Clinic. Here also he spoke at length on the aims and objects of I.M.A. and appealed to the members present to contribute liberally towards the Central Office Building Fund of I.M.A. Dr. Sen left Rajkot for Junagadh accompanied by Dr. C. A. Martins, District Medical Officer at Junagadh. Dr. Sen was cordially received by members of the Junagadh Branch who had assembled in good number and had tea with him. Here he spoke of unity in the profession and appealed to the members present to take more interest in association work. He also joined an excursion party arranged by Saurashtra Government to "Gir Jungle" for the *Shikar* of the famous lions of Gir which he enjoyed very much.

On the morning of 12th February, Dr. Sen left for Dhoraji and was cordially received by members of the Dhoraji and neighbouring branch of Upleta and Jetpur and a nice reception was held by the President and members of Dhoraji Municipality. Dr. Sen very much appreciated the co-operation and cordial relations that existed between Government Medical Officers and private medical profession who were all members of I.M.A. Dr. Sen spoke on preventive and social medicine before the citizens and members of I.M.A. and further stressed the need of this type of unity amongst the rank and file of the medical profession all over the country.

Dr. Sen left for Porbandar by car and was received by the President and members of the branch. A dinner was arranged where all members of the branch and prominent citizens and Government officers were present. Dr. Sen highly appreciated the working of the Branch and the regular scientific meetings and appealed to them not to relax these activities. Next morning he visited some of the public places and paid his respects to the "Kirti Mandir" raised in the memory of "Bapuji" the father of the nation. Dr. Sen left Porbandar for Jamnagar on 13-2-54 and was received by the President and members of the Jamnagar branch at the aerodrome and driven to the residence of Dr. K. L. Mehta, President, Jamnangar Branch. He was shown round the hospital, the Ayurvedic College and the All-India Ayurvedic Research Institute. Dr. Sen met members of the profession at a lunch by the Jamnagar Branch where he spoke to the profession laying particular stress on unity amongst its members, and also on important aspects of social medicine and general practice. Dr. Sen also had an audience with the Raj Pramukh of Saurashtra. He left for Ahmedabad by evening train on 13-2-54 reaching Ahmedabad in the morning

DR. S. C. SEN, PRESIDENT, I.M.A. (*seated centre*), WITH EXECUTIVES OF THE GUJARAT & SAURASHTRA PROVINCIAL BRANCH, I.M.A.

of 14-2-54. He was welcomed at the station by the office-bearers of the Gujarat and Saurashtra Provincial Branch and the members of the Managing Committee of Ahmedabad Branch and garlanded by the President of Ahmedabad Branch, and was driven to the residence of Dr. Motibhai Patel. At 10 a.m. Dr. Sen attended the meeting of the Working Committee of Gujarat and Saurashtra Provincial Branch and also had a group photo with the members and later a lunch with the Provincial Working Committee. In the afternoon Dr. Sen visited the newly constructed Sheth L. G. Hospital at Maninagar and was received and taken round by Dr. N. R. Desai, Surgeon Superintendent of the hospital. At 5-30 p.m. Dr. Sen attended at 'At Home' held in his honour by the Ahmedabad Branch. Nearly 400 members including guests attended the function. Dr. Sen spoke on the aims and objects of Indian Medical Association and also touched every aspect of medical profession stressing on medical ethics and unity in the profession. He also strongly criticised the Governments that are out to experiment with various systems of medicine in their State and thus deliberately creating compartments. Later on he attended a Dinner arranged by the Sabarmati Branch of I.M.A. On 15-2-54 morning Dr. Sen visited the Civil Hospital and B. J. Medical College, Ahmedabad and here he addressed the students on Medical Education in foreign countries and laid stress on systems of examinations and appealed to the authorities to go into the question of this high percentage of failures in University examinations. Dr. Sen had lunch with the members of the Managing Committee of Ahmedabad Branch. A group photograph was taken on the occasion. In the afternoon Dr. Sen had tea with the Directors of Sarabhai Chemical Works in the Calico Mills premises and on his return visited a Physio-Therapy Clinic in Ellis-Bridge. In the evening he attended a dinner by the Society of Industrial Medicine and here he spoke at length on the E. S. I. Scheme and the attitude of I.M.A. He appealed to the members to give all co-operation to the Government in the early implementation of the scheme as it was really a great step towards medical relief for working classes. On 16-2-54 Dr. Sen left for Baroda and was received at the Baroda station by the President and members of the Baroda Branch, I.M.A. He was then taken round the Medical College and T. B. Hospital and Sanitarium and Alembic and Sarabhai Chemical Works. Dr. Sen had lunch at the Sarabhai Chemical. In the afternoon he had tea with the members of the Baroda Branch, I.M.A. and he talked to them on social medicine. He also dined with members of the Managing Committee and the Baroda Branch. Dr. Sen left Baroda for Broach on 17th morning and was received at Broach by the President, Dr. Miss Hadkar, and members of Broach Branch, I.M.A. He visited Sevashram hospital and had lunch with the members of the Branch. In the afternoon he was invited to tea by the members of the Broach Branch where he again stressed the question of unity in profession and medical ethics. He left Broach after tea and reached Surat at about 7-00 p.m. and drove straight to the Medical Association Hall where he addressed the profession on the aims and objects of I.M.A., medical ethics, social medicine, rural medical aid, etc. and later had dinner with the members of the Surat Branch where some prominent citizens and local Government officers were invited. Dr. Sen left Surat by Delhi Express on 18th morning for Bombay.

Thus within a short period of one week about 13 branches of the province got an opportunity to meet Dr. Sen. All branches visited by him were immensely benefited by his presence.

DR. S. C. SEN, PRESIDENT, I.M.A. (*seated centre*), WITH MEMBERS OF THE MANAGING COMMITTEE OF AHMEDABAD BRANCH, I.M.A.

NOTES AND NEWS

D.T.M. & H. COURSE, CALCUTTA UNIVERSITY

The nine months' course of instruction for the D.T.M. & H. examination under the Calcutta University which is open to medical graduates of Indian Universities or candidates possessing equivalent qualifications will begin on the 15th October, 1954. Applications for admission in the prescribed form (obtainable from the School office) should reach the Director, School of Tropical Medicine, Calcutta by 31st August, 1954.

ORISSA COUNCIL OF MEDICAL REGISTRATION

In the meeting held on 19-1-54 the following important matters were discussed.

1. The Council ordered for the removal of the names of the following registered medical practitioners from the State Medical Register as they were found to be guilty of infamous conduct in professional respect.

Name	*Orissa Registration number*	*Period for which removed*
(1) Dr. Gour Hari Patna, L.M.P.	155	Two years
(2) Dr. R. C. Sen Gupta, L.M.P.	265	Six months
(3) Dr. A. K. Mukherjee, L.M.P.	1022	Permanently

2. The Council considered the question of granting medical certificates by unauthorised persons and it was unanimously resolved that Government will be moved to enact legislation to stop issuing medical certificates by such persons and to issue necessary instructions to all concerned to dishonour such certificates.

3. The Council considered the question of adoption of Code of Medical Ethics as adopted by the Medical Council of India and suggested the following modifications in them

(1) The following be added as a sub-para under heading "State Laws" in article 8.

"Physicians treating patients should at all times endeavour by persuasion to impress on them and their families the importance of steps to be taken for prevention and spread of disease and environmental hygiene".

(2) The following be added as conditions VII and VIII and the condition VIII be renumbered as IX, under heading "Termination of Services" in article 18.

"VII. Where the patient or patient's guardian fails to pay the professional fee and fails to procure the remedies prescribed by the physician and when the advice given by the physician to get the patient admitted into a hospital or an institution for better treatment is not accepted".

"VIII. Where the practitioner finds that the patient, his guardian and/or responsible relatives and friends question the bonafide and integrity of the practitioner covertly and overtly expressed".

(3) The article under "Amendments and Alterations" be substituted for the following:

Amendments and Alterations:

"No amendments to the basic principles of foregoing Code of Medical Ethics shall be made without consulting the State Council of Medical Registration. The State Councils, however, may frame and enforce rules and bye-laws suitable to their local conditions but in conformity with the foregoing Code of Medical Ethics. Copies of such Rules and Bye-Laws and other subsequent changes shall be lodged with the Medical Council of India".

UTTAR PRADESH STATE MEDICAL COUNCIL

Extracts from the minutes of the meeting of the Uttar Pradesh Medical Council held at Lucknow on December 4, 1953:

The Council unanimously judged Dr. Prabhas Ranjan Pujari, M.B., to be guilty of infamous conduct in a professional respect under section 28 of the U. P. Medical Act, and unanimously decided that his registration be suspended for two years.

Budget estimates for 1954-55 and revised budget for 1953-54 were unanimously passed. It was further decided that a provision of Rs. 4,000 be also made for filing an appeal in the Supreme Court in Dr. Kesarbani's case.

It was decided that the sitting members of the Standing Committee may continue during 1954 also.

WEST BENGAL COUNCIL OF MEDICAL REGISTRATION

1. The Council decided that the following qualifications be recogninsed for entry in the Register as additional qualifications under section 21 of the Bengal Medical Act, 1914:—

(1) Diploma in Child Health (D.C.H.), London.

(2) Diploma, Royal College of Obstetrics and Gynaecology (D.R.C.O.G.), London.

(3) Diploma in Gynaecology and Obstetrics (D.G.O.), Calcutta University.

(4) Diploma in Ophthalmology (L.O.), Madras.

(5) F.R.C.O.G. (London) and M.R.C.O.G. (London) were recognised for entry in the Register as additional qualifications under section 21 of the Bengal Medical Act, 1914.

2. Recognition for the L.M.F. Examination of the Calcutta Medical School, the National Medical Institute (School Section) and Jackson Medical School, Jalpaiguri was extended up to December, 1954.

KANKE MENTAL HOSPITAL FOR ALL-INDIA PATIENTS

The Government of India has taken over the management of the Hospital for Mental Diseases at Kanke for treatment of patients of different States of India.

The Director-General of Health Services, Government of India, has already taken charge of the administration from June 1, 1954. So long the hospital was being run by a Committee constituted by the Government of India.

Th other hospital at Kanke which generally accommodates patients suffering from mental diseases from West Bengal, Bihar and Orissa, will however, continue to be run by an Advisory Board comprising representatives of these Governments.

TRADE IN SPURIOUS DRUGS

Dr. B. C. Roy, Chief Minister of West Bengal, called upon every citizen to help the Government to eradicate the menace of the trade in spurious drugs.

Speaking at a preview of the West Bengal Government's short documentary in Bengali, entitled "Worse Than Criminals", Dr. Roy outlined the measures that people might take to foil the attempts of the anti-social racketeers in spurious drugs. These elements, he said, in order to obtain empty phials and bottles with the original label intact of well-known drugs and injections, utilised the help of unawary housewives, buyers of used bottles and compounders of small pharmacies. Also the marketing of fake drugs was made easier by the manufacturers' providing agents with a big percentage in commission. The bottles and packages containing spurious drugs were prepared so perfectly that it was difficult to differentiate between them and the genuine products. However, it was the social duty of all to see that the labels of all containers of medicinal products were torn away before being thrown away or destroyed. Every citizen should also immediately inform the police whenever he came across any evidence of trade in spurious drugs.

F. A. O. REPORT ON FOOD

The United Nations Food and Agriculture Organization reports that in the 1952-53 season, for the first time since before World War II, the world's total food production caught up with the growth in population. The FAO report points out that this favourable trend is not by any means true of all regions. People in many areas, especially in the Far East, still have less food than before the war. According to the FAO, 70 per cent of the world's people do not eat enough to maintain their health and strength. The report stresses the immediate need for greater agricultural production in the underdeveloped areas.

BANARAS AYURVEDIC MEDICAL COLLEGE ANNUAL DAY

Rajkumari Amrit Kaur, Union Health Minister, while addressing the Ayurvedic Medical College, Banaras Hindu University on the occasion of its Annual Day celebrations said "If Ayurveda is to make its distinctive contribution to modern medicine, it can only be done by those of its protagonists who are scientifically trained themselves and able to do research and bring to light that which can enrich the intricate art of clinical medicine. Only true dedication to the science of Ayurveda can restore to it its pristine

glory." She insisted on scientific research and said, "this will be the best way whereby we can turn out Vaidyas worthy of their ancestors of centuries ago. The truly scientific world is a receptive world and I have no doubt that any contribution made by such men will be received gladly and incorporated in modern medicine."

She continued "modern medicine has advanced to such an extent and the ways and means available to it to-day to promote human welfare are so immense that there can be no question of supplanting it by Ayurveda or any other form of medicine. The Government is however anxious that whatever is useful in the way of drugs, principles and practices in our rich heritage of Ayurveda should be sifted carefully by modern scientific methods and saved for all time."

RAPTAKOS MEDICAL RESEARCH BOARD FELLOWSHIP

The Raptakos Medical Research Board will consider applications for the award of fellowships for research work on medical and allied subjects in recognised institutions in the Union of India.

The awards normally consist of Rs. 3,000/- per year for a Fellowship and Rs. 750/- per year towards special equipment or chemicals approved by the Board.

Applicants should have an M.B., B.S., or M.Sc. degree or its equivalent or not less than two years' experience in research work after B.Sc.

Applications in the prescribed form, for grants for the year commencing January 1, 1955 should reach the Secretary and Treasurer, Raptakos Medical Research Board, Dr. Annie Besant Road, Worli, Bombay 18, before September 1, 1954, through the guides, under whom research work will be carried out, and the heads of the institutions.

ALL-INDIA PEDIATRIC CONFERENCE

Under the auspices of the Indian Pediatric Society, the 6th All-India Pediatric Conference will be held in Lucknow in February, 1955, under the presidentship of Dr. Sujata Chaudhuri, F.R.C.P.E., M.R.C.P. The deliberations of the conference will be devoted principally to the following subjects: (1) Nutritional problems of children, (2) Communicable diseases of children, (3) Normal Growth and Development, and (4) Morbidity and Mortality in children. Pediatricians, child health workers and medical men in general are cordially invited to present papers at the conference.

Further particulars regarding the conference should be addressed to the Hony. Secretary, Indian Pediatric Society, 56/2, Creek Row, Calcutta 14.

LEPROSY PROBLEM IN INDIA

The Union Ministry of Health has set up a committee, with the West Bengal Minister of Medical and Public Health as chairman, to consider steps to be taken to control leprosy in India.

The other members of the committee are the Health Ministers of Bombay, Madras, Orissa and Delhi, or their nominated representatives.

The committee has been set up in pursuance of a decision taken by the Central Council of Health at its second session held at Rajkot in February last.

DRUGS AND MAGIC REMEDIES ACT

The Act passed by Parliament recently is intended to control the advertisement of drugs in certain cases and to prohibit the advertisement for certain purposes. The Act will be enforced on a date to be notified in the Gazette after the publication of the rules in this regard.

INSTITUTE OF MEDICAL PHYSICS

A plan for establishment of an Institute of Medical Physics in Calcutta, the first of its kind in India, is now ready. One of the main objects of this new branch of scientific study will be to help in fighting some of the dreaded diseases of human beings. The proposed institute will require about an acre of land and will cost about Rs. 20 lakhs for the building with its equipment. The Calcutta University, it is repored, is negotiating for purchase of a plot of land for establishment of the institute.

The objectives of the institute will be: (1) Promotion of research in different aspects of medical physics in general; (2) training of personnel as biophysicists and hospital physicists for which no facilities exist at present anywhere in the country; (3) to offer facilities and help to individual scientists, medical or biological institutions requiring the use of special physical apparatus or methods in their work, which are not available to them at present; (4) to arrange in co-operation with the post-graduate medical institutions, for the practical and theoretical training on the application of theories and methods of modern physics to actual medical problems; and (5) teaching of radiological physics to medical graduates, who want to specialise as radiologists.

The institute will be run by a governing body consisting of (a) a representative of the Ministry of Health, Government of India, (b) a representative of the Government of West Bengal, (c) one representative of the different co-operating medical research institutions, (d) a representative of the donors to the institute, (e) a representative of the Ministry of Education, Government of India, (f) the director of the institute and (g) three well-known scientists including a physicist, a chemist and a biologist.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM

The International Conference on Thrombosis and Embolism will be held on July 20-24, 1954, at Basle, Switzerland. This conference will be followed in Geneva by the International Congress of Gynaecology and Obstetrics. Doctors interested in these subjects are invited to the conference by the General Secretary, Gynaecological Clinic of Basle University, Basle, Switzerland.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, LONDON

The Royal Institute of Public Health and Hygiene conducts a recognized Course of Instruction (for postgraduate medical men and women only) for the Certificate in Public Health Examination of the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England. This leads to Courses for the Diploma in Public Health and for the Diploma in Industrial Health.

The next Course of Instruction for the Certificate in Public Health will commence on the 1st October, 1954.

Necessary information, may be obtained from the Secretary of the Institute, 28, Portland Place, London, W.1

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributors

FAMILY PLANNING

SIR,—I am afraid very few thinking people will agree with Dr. Ray Chaudhury's opinion on the subject of family planning expressed in the I.M.A. Journal for April 1954. In the first place the question is not whether India has surpassed the level of her optimum population, but whether India's capacity for food production can increase in proportion with the rise in population. After over twelve years of rationing and serious efforts at food production we have just been able to produce food enough to support the present population.

The last census report shows an increase of 12 per cent in the population during the previous ten years. This percentage is bound to increase with better sanitation, and measures to control malaria, tuberculosis and other preventible diseases. Moreover, the revolutionary advance made in the treatment of these diseases is certain to increase the rate of growth of the population and within the next six decades the population of India will be doubled and we cannot hope to increase our food production in the same proportion for many reasons.

Intensive industrialization of the country towards which we are heading fast is bound to draw a good proportion of rural labour to cities and large areas of agricultural land taken up for industrial development and residential purposes for the increasing population will surely affect food production adversely.

The only rational remedy for this seems to be birth control or family planning or whatever name you give it. This practice has been in vogue for some time with more intelligent classes but it is for the poorer classes who through ignorance and thoughtlessness breed indiscriminately. In my limited experience I have come across many poor people with large families whom they find difficult to support. I am citing some examples. A motor driver earning Rs. 75/- a month has twelve living children out of thirteen, two grown up girls are married and he has to support his wife and ten children. His wife is young and good for three or four more pregnancies. A milkman aged 42 has ten children and his monthly income about Rs. 50/-. A cook aged 37 has five living children, his wife is good for five or six more pregnancies, his monthly income is Rs. 50/-. A washerman aged 39 has five children, the combined income of himself and his wife does not exceed Rs. 50/- a month. I could cite many more instances. In all these cases when questioned the same reply is given viz., God gives them. God gives us rain but we carry mackintosh and umbrellas for our protection.

It is difficult to imagine how an all comprehensive national planning, whatever that might mean can solve the problem of rapidly increasing population. One often hears some puritanical people advising self-control as a remedy for checking the increase in population, but considering what human nature is, this excellent advice is not at all likely to be universally adopted. Such advice is tendered by those who are old and impotent. I am, etc.,

M. S. IRANI.
LT.-COL. I.M.S. (RTD.)

Poona

PHARMACEUTICAL INDUSTRY IN INDIA

SIR,—We have carefully read the editorial of the Journal of the Indian Medical Association, March 1954 under the caption, 'Pharmaceutical Industry in India'

The first impression that one gets from the same is that it is one-sided as the balance of judgment has not been held evenly between the issues and the parties involved. To quote from your own lines, "before they (i.e. the pharmaceutical industries) expect any concession and help from the Government, we would like to ask the people who look after the industry whether so long and so far they have managed the industry to the best of their abilities! Whether they have done all that is expected from them!" The very manner of putting the question evidently presumes a negative reply,—whereas, we can assert from experience and knowledge that the answers to these questions are emphatically in the affirmative, if by pharmaceutical industries you mean the recognised pharmaceutical manufacturers of India, who have to conform to and comply with the rules and regulations laid down by the Indian Drug Act 1940 and the Drug Rules 1945.

You have further stated "if the manufacturers followed the recommendations and directions *in toto* we are of opinion, they would not be in the difficult position they are to-day. Before asking for more concessions, the Indian drug industry must create a prestige for itself and command the confidence of the medical profession. We have been warning the industrialists for a long time, appealing to them to broaden their outlook, and the time has now come when they have to take a serious decision if they want to survive in the struggle for existence. It cannot be denied that in the majority of cases the manufacturing concerns are working under conditions of "insufficient accommodation, inefficient personnel, inadequate appliances and improper control". You have also endorsed the views and agree that "licence for manufacture should be issued after careful scrutiny of (1) buildings, floor space and environments, and (2) personnel, equipment and appliances. Permission to manufacture parenteral preparations should be given after rigid inspection and after satisfaction that all conditions are properly fulfilled." But if you for once care to enquire into the fate of pharmaceutical concerns of India, all of whom have to fulfil the conditions stipulated above, do you really cherish any doubt that the pharmaceutical industries of India have 'yet to create the prestige' for themselves and command the confidence of the medical profession? These are days of precise standardisation. The Drug Act and Drug Rules are there,—and are constantly vigilant to enforce them in all the important provinces in India. The very unfortunate presumption, which you have happened to create against them by the aforesaid observations,—is that they are not worthy of the salt of the country they live upon or the confidence bestowed upon them by the medical profession. The facts, on the contrary, are entirely otherwise. Whatever work they might have done, they may be doing or they may strive to do, have not stood them in good stead to win the opinion or the judgment of the medical men of the country.

As is our wont, we attach higher values to the products manufactured overseas even though their exact counterparts, precisely of the same quality and standard, are made by Indian manufacturers. For the sake of argument, let us cite only one instance amongst so many others. The Standard Pharmaceutical Works Ltd. synthesized nikethamide B.P.

under the name and title of 'Cormid' (nikethamide B.P., 25 per cent sterile aqueous solution) quite a considerable time ago. The product has been tested in Government institution and certified by wellknown medical men and Government hospitals to be of precise B. P. standard.

They expanded their department and equipped the same in a manner that they could undertake to supply the entire needs of the country for this particular product. Yet in spite of repeated representations neither the Government nor the medical institutions of the States and the Union Government, nor the medical men have extended to them the encouragement and support to which they were legitimately entitled. The result is that they find themselves in the unenviable position of one who has 'caught a Tartar'. They cannot afford to maintain or expand the department without adversely affecting their economy, nor can they cut down or retrench their staff without raising a murmur of discontent amongst the employees!

You have very rightly pointed your finger at the "weeds and mushrooms" in the industry. They represent nobody but themselves and are out to carry on a trade on spurious and misbranded preparations. Your observation is also correct that the drug control machinery in the different States should remain vigilant and ruthlessly destroy these undesirable elements.

The very unfortunate position in the country to-day is that we are robbing good 'Peter' to remunerate the evil genius of 'Paul' for his underhand and nefarious activities!

Majority of the medical men are not aware of the great development and progress made by the reputed Indian pharmaceutical concerns. It may be enquired how many amongst the medical men or amongst your editorial staff have taken the trouble of visiting the laboratories of the pharmaceutical concerns in recent times. Your editorial comment is evidently more destructive than creative. It would have been highly commendable if your comment would show where the industry has developed and where it lacks development as the interest of many medical men are concerned in this industry. A country which is just striving to attain a higher standard of scientific progress requires co-operative help and advice and not a sword of Democles. It would be a great encouragement if you would suggest that a group of well-known medical men nominated by the Indian Medical Association should visit the laboratories of the well-known pharmaceutical concerns to see for themselves, to get first-hand knowledge of the development of the industry and to suggest improvement when it is thought necessary. I am, etc.

Calcutta, (DR.) A. K. BANERJEE,
M.B.B.S.

* * * *

EDITOR'S NOTE:

In the editorial under reference, all licensed firms were taken into consideration and criticisms were directed mainly against those who are not complying with the rules and regulations laid down by the Indian Drugs Act, 1940, and the Drug Rules, 1945. The author of the article "Pharmaceutical Industry in India", published in the same issue of the Journal, had personally inspected a number of licensed manufacturing houses, and evidently was not satisfied with the prevailing conditions; the editorial should be read in context to his article.

So far as the prestige of the industry is concerned, a reference to the article would clarify the issue. Discussing this point the author writes, "mushroom firms by issuing low quality and sub-standard drugs in the Indian market have lowered the prestige of the industry and are responsible for the loss of confidence by the medical profession for the Indian pharmaceutical preparations." In the interest of the industry, those who are guilty of such offences rightly deserve our criticisms. There are of course some other factors to be considered. It cannot be denied that India still imports several crores of rupees worth of medicinals annually. Why? and who demands them? The pioneer foreign firms, by their original contributions in the field of antibiotics, chemotherapy, etc., have created such confidence in the medical profession that the latter has complete faith in the quality of their products. "Our industry should be organised on proper lines and asked to prepare almost all the items that are at present being imported". This would enable it to compete with the foreign firms on merits of quality and prove to the medical profession that what they get is in no way inferior to those imported. To replace the foreign products they must also carry on continuous researches and put before the profession newer remedies tested scientifically and capable of throwing newer lights on therapy."

In our editorial we only wanted to point out the existing defects in the organization and the outlook, so that those who genuinely want to make improvements could take this as a timely warning. Of course, as a measure of help we are always appealing to the State machinery to be vigilant and ruthlessly destroy the undesirable elements in the industry.

REVIEWS

THE 1953-54 YEAR BOOK OF OBSTETRICS AND GYNECOLOGY. Edited by J. P. Greenhill, B.S., M.D., F.A.C.S. The Year Book Publishers Inc., 200 East Illinois Street, Chicago 11, Ill, U.S.A. Pp. 567: price $6·00 post paid.

This volume belongs to the "family" of Year Books, which have carved out for themselves a well deserved place in every medical library, private or public. Since the demise of late Dr. De Lee, Dr. Greenhill has been in sole charge of editorship of both the portions of this volume. The present volume has maintained the high standard set by its predecessors. The abstracts are well chosen, varied, and presented ably with suitable editorial comments from experience, every now and then. Neatly produced, with many illustrations and well bound, this volume will be of distinct help to doctors who want to keep themselves abreast of time in Obstetrics and Gynecology.

TEXTBOOK OF GYNECOLOGY. By John I. Brewer, B.SC., M.D., PH.D. First edition, 1953. Pp. xvii plus 532 with 146 illustrations. Price 7s. 6d. Bailliere, Tindall and Cox, London.

Quite a number of textbooks have been published in recent years. Some of these are entirely new books, some others again are further editions of extant works, these later editions often coming up after long intervals. The author of the present volume is an experienced teacher. He has found that the clinical approach to the patient and her foremost symptoms, or salient findings on examination, are appreciated by the students much better and more easily, rather than abstract discussions of disease entities in didactic lectures. With emphasis on such clinical teaching the students have

been found to learn to think, use books of reference for consultation and to view the patient as a whole while considering a specific pelvic symptom or problem. The present volume has followed this plan of clinical approach to the study of the disease entities, thus deviating—with very good effects—from the usual style followed in gynecological textbooks. The style of presentation of the subjects and their dealing is good; this is made more interesting with a number of plates. Printed throughout in art paper, the printing, get-up, binding are all very good. A very useful neat textbook for the undergraduate who nowadays is being burdened with an increasing volume of textbooks.

AIDS TO SURGICAL DIAGNOSIS. By Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., M.CH., D.SC., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S. Third Edition, 1954. Pp. viii plus 252 with 15 illustrations. Balliere, Tindall and Cox, London. Price 6s. 6d. net.

This volume is one member of the well-known "Students' aids series" which has a total of 48 volumes intended to help the students preparing for their examinations. This third edition of the book has appeared after an interval of 22 years, and hence, of necessity, has been thoroughly re-written. This fact has made this book interesting and at the same time very useful to the students who often want a quick revision of their subjects before the examinations. Printed in clear types, in spite of its small volume, the book makes reading easy and useful. A few more illustrations would have been very welcome; but, perhaps, space did not permit this. As an "aid" to surgical "diagnosis", this book can be well recommended to students and also to practitioners.

FEARLESS CHILDBIRTH: What Every Mother-to-be Should Know. By M. Randell, O.B.E., S.R.N., S.C.M., F.C.S.P.(Hon). 2nd edition, 1953. Paper bound, pp. 104. J. & A. Churchill Ltd., London. Price 3s. 6d. net.

This book is the outcome of oft-repeated requests by many midwives for "a simple non-technical book which the mothers can read for themselves". Sister Randell has really done an excellent job in executing this task. The book is written in simple everyday language, and anatomical terms are expressed in the words used by the majority of patients who attend hospital clinics in the United Kingdom to-day. The chapters follow the natural plan of the nature of talks, advice and instructions given to the mother-to-be from the time when she first consults her midwife to the days—with their inherent problems—when the baby has come and is being happily looked after by the mother. The chapters on "Relaxation makes you fit and fearless", "How to help yourself when in Labour" and "How to regain your figure" deserve special mention. These are very helpful pages, particularly because of the illustrations. The last chapter "Diaries of the arrival of First Babies, told by their Mothers" will be very stimulating to the mothers-to-be for whom this book is primarily written. This is a very useful book not only for mothers-to-be, but also for their doctors who have frequently to advise them.

TUMORS OF THE CENTRAL NERVOUS SYSTEM (Section X—Fascicles 35 and 37 of the series—ATLAS OF TUMOR PATHOLOGY). By James W. Kernohan, M.D. and George P. Sayre, M.D., Washington, D.C., U.S.A., 1952. Pp. 129 with 126 illustrations. For sale by the American Registry of Pathology, Armed Forces Institute of Pathology, Washington 25, D.C., U.S.A. Price 90 cents.

This volume is a part of the Atlas of Tumor Pathology, published by the Armed Forces Institute of Pathology. The whole subject of this volume has been dealt with very ably in subdivisions like—Tumors of the Nervous Tissue, Tumors of Mesenchymal Tissue, Meningiomas, Tumors of Developmental Defects and Tumors of the Pineal Body. The text is well presented, supported by numerous naked eye pictures and microphotographs—126 in all. A very readable book dealing with an absorbing subject. Every neurologist, neurosurgeon, pathologist and library of a teaching medical college should have a copy of this book.

TUMORS OF THE PARATHYROID GLANDS. (Section IV —Fascicle 15 of the series—ATLAS OF TUMOR PATHOLOGY). By Benjamin Castleman, M.D., Washington, D.C., U.S.A., 1952. Pp. 74 with 53 illustrations, several in colour. For sale by the American Registry of Pathology; Armed Forces Institute of Pathology; Washington 25, D.C., U.S.A. Price 65 cents.

This volume is the fifteenth fascicle in the series of Atlas of Tumor Pathology published by the Armed Forces Institute of Pathology, under the auspices of the Subcommittee on Oncology of the Committee on Pathology of the National Research Council, U.S.A. After a few pages on the normal parathyroid gland, the entire text has then been discussed in three main heads—primary and secondary hyperparathyroidism, and nonfunctional enlargement. In a space of 74 pages of the book, has been laid out ample reading matter with 53 illustrations most of which are art-plate reproductions of microphotographs. There are also a few very good coloured plates. The whole subject matter has been very ably dealt with and presented to the reader who never gets tired in reading through this volume. This volume should be in the library of medical institutions doing teaching or research work.

YOUR QUESTION

Correspondents should give their names and addresses (not necessarily for publication) and include all relevant details in the questions which should be typed. Questions of medical interest only will be acceptable for this section. They should be sent in a separate envelope marked. "Your Questions." Questions of general interest will be published in preference. Lack of space precludes answering all the questions received.

Q. I shall be grateful if you kindly let me know whether Testoviron injections will have any action on the blood pressure of a middle aged man whose average B.P. is 150/90 mm.

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In the **INDIAN JOURNAL** of Venereal Diseases and Dermatology Vol. 20., No. 1 Jan.–Mar. '54 7-12, Dr. K. C. Sahu, Assistant Professor and Physician I/C Skin & V. D. Dept.,; S. C. B. Medical College and Hospital, CUTTACK writes ; "Strontium-bromide 10% 10 c.c solution (Ekzebrol) is the medicament of choice in cases of itching skin affections with or without exudates. The results in different varieties of cases reported are uniformly good. This drug has been tried by me in S. C. B. Medical Hospital..... remarkable effect has been observed..... in the treatment of 42 cases. Bromine when administered parenterally acts centrally and peripherally on the nervous system.....lowers the perception of skin irritation and has a general calmative effect on the patient.....The property of strontium is to tighten or constrain the vessels and cell membranes and hence check exudation & exert desensitization effect."

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SUPPLEMENT

Journal of the Indian Medical Association

VOL. XXIII, NO. 10 CALCUTTA JULY, 1954

V ASSAM PROVINCIAL MEDICAL CONFERENCE, TEZPUR

The 5th Assam Provincial Medical Conference was held at Tezpur on the 28th February 1954. The conference started with the hoisting of the National Flag by Shri Omeo Kumar Das, Minister of Education, Government of Assam. This was followed by inauguration by Dr. A. K. Ray Choudhury. The Chairman of the Reception Committee then read out his welcome address. Dr. B. Barooah formally proposed Dr. J. C. Das for the presidentship and Dr. Das took the chair amidst applause. An exhibition was held in connection with the conference and this was opened by Shri Omeo Kumar Das.

In course of his presidential address, Dr. J. C. Das said,

"All medical conferences the world over, are held for mainly one purpose viz., the increase of our knowledge of diseases to improve the health of the people and to prevent the spread of diseases and to find out ways and means how best we can treat them, cure them and make them healthy and wealthy to do their duties as citizens. For this reason attention should first be concentrated chiefly on medical relief.

Prevention is better than cure. But we cannot force preventive measures on unwilling people. There are however some hopeful signs in our country. Thousands of people are coming to-day for injections for the treatment of Kala-azar which is one of our major scourges. Inoculation against cholera is readily accepted by people who a few years ago would have resisted it to death. People with early leprosy are coming forward in numbers for treatment and generally there is a qualifying increase of the receptiveness of the people for modern methods of treatment and prevention of disease. Apathy and indifference are disappearing and in places there is an embarrassing demand for medical and preventive measures. We should think how best we can meet these demands.

I also do not believe in making speeches. I would refrain from discoursing on the vast field of socio-political problems which have been with us for so many years and which no amount of ineffective talk is going to solve. We know that our country has taken a big decision by taking up five year plan and I am sure, it will improve the future of our profession and possibly the health and happiness of our people. I do not believe in harping on the failures of others and the shortcomings of those who have been here before us. The question is not what others have or have not done but rather it is what we are going to do with our work.

We should train many more doctors, pharmacists and nurses quickly and at the same time create a keen desire in our people for cleaner living and better health. I believe that our great contribution in this direction is the evolution of a concept of a positive health. I, therefore, consider that it is not only desirable to improve the health of the people but it is the duty of every citizen of the Republic to remain healthy and combat disease promoting conditions. It is not only incumbent on the State to provide facilities for this purpose, but it is also obligatory on every citizen to assist the State in the total utilisation of all such facilities.

MALARIA AND HOOKWORM:

A special mention needs be made about the prevalence of malaria and hookworm in this State. You are fully aware that malaria is a very common disease. It takes the heaviest toll of lives every year in this State. The measures that have so far been taken to prevent and cure it are still primitive and inadequate. What is needed is adequate arrangement for up-to-date treatment and preventive measures at the minimum cost. Unless the remedy is within the reach of the common man, no plan for cure and prevention will be effective. The widespread incidence of hookworm has since similarly been a menace to the common man. The virulence of this disease could not be rightly foreseen. It has primarily thrived on the ignorance and insanitary habit of the village people. What is urgently needed is collection of statistics, arrangement for educating the public on the cause and consequence of the disease and planned facilities for its treatment.

THE MEDICAL NEEDS OF THE RURAL AREAS:

India is predominantly a rural country; about 80 per cent of her people live in villages and about 75 per cent are engaged in agricultural pursuits. Total number of villages in India is about 6 lakhs. In the villages medical relief is practically non-existent. Sanitation, water supply, and housing are much neglected. Food, inadequate in quantity and quality is not obtainable readily by the majority. Such is the picture of the rural areas. The problem of rural health is a big question, something has to be done substantially and done quickly to improve the situation.

DR. J. C. DAS
THE PRESIDENT OF THE CONFERENCE

Government has opened several subsidised hospitals in rural areas but the main difficulty in giving medical relief to these areas lies in the lack of medical personnel volunteering for work in those areas. This accounts to a great extent for the tendency on the part of the doctors to congregate in the towns in preference to the villages. I am confident that the members of my profession will be always willing to go to the villages if adequate remuneration is given to them, proper education is provided for their children and proper facilities are made available to maintain their professional knowledge up to date.

It is not possible to make arrangement for medical aid separately in each village with our present available medical men and finance. But it can certainly be arranged in groups of villages.

MATERNITY AND CHILD-WELFARE:

In this, as in other fields of health endeavour, voluntary organisations have played an important role. In 1930, voluntary work in this field was centralised by the establishment of the Maternity and Child-Welfare Bureau under the Indian Red Cross Society and the appointment of a Director of that Bureau has been responsible for promoting the development of this branch of health activity in different parts of the country.

The responsibility for providing such services rests upon the Government and they cannot relieve themselves of any part of that responsibility by making grants to voluntary

organisation over whose activities they have very little control. While voluntary efforts should be so supervised and controlled as to ensure that this health service conforms to the standard prescribed by the Director of Health Services.

I therefore, suggest that the Provincial Government should exercise closer supervision and control over the Maternity and Child Welfare activities of the Red Cross Society.

CHILD WELFARE:

The child of to-day is the man of to-morrow. It is, therefore, right and correct that in order to have a strong, healthy and useful citizen, the physical and intellectual development of the growing children should be looked after. The prevention of disease in the country is still in its initial stage, the Child Welfare Societies and their programme are very inadequate. Thousands of children are blinded, maimed and die for want of knowledge of elementary rules and principles of hygiene and sanitation on the part of their parents.

Experience all over the world has shown that the provision made for the health of the school children by periodical examination and correction of defects has proved to be a sound investment in respect of betterment of the health of the nation. Some years ago this branch of the Association formulated a scheme and submitted it to the Government for action. But I regret to state that the Government took no action about it and put it in cold storage.

DHAI AND MIDWIFE:

The appalling rates of maternal and infantile mortality in this country are well known to you. To avert this widespread calamity efforts are to be made to attract our women of even a low standard of education to the profession of Dhai and Midwife.

There are only five centres in Assam where Dhai and Midwife are trained and we require more.

A Dhai training class was started in August 1949 at the Gauhati Civil Hospital by the Branch of the Red Cross Society of the town and in April last a midwife class has also been started. Several girls have passed and secured Dhai certificate from the Victoria Memorial Certificate Fund. Some of these girls have been uttilised by the Kasthurba Gram Sangh and in some villages. I am told that they are doing splendid work in villages.

PUBLIC HEALTH:

The subject is of fundamental importance for the future of medicine lies in the prevention of diseases and not only in their cure.

Although it is laid down by the Medical Council that "throughout the whole period of study the attention of the student should be directed by his teachers (a) to the importance of the measures by which normal health may be assessed and maintained and (b) to the principles and practice of the prevention of disease", little has been done and achieved in this respect. I do not know whether the Medical College at Dibrugarh has a planned method of approach to tackle this problem.

The importance of social medicine is even now imperfectly realised. The follow up cases is defective, the enquiry into environment hygiene is perfunctory and the follow up in the home to study conditions there with a view to arriving at more satisfactory conclusions in regard to the influence of home conditions on the causation or the prevention of diseases, is hardly ever attempted.

It may be suggested in this connection that a comprehensive Public Health Act should be enacted by the Government with a view to dealing with the various cases of common offences. I am told that such a legislative measure is already on the anvil of the State Assembly and we hope that it will soon see the light of the day.

HOSPITALS:

In the State hospitals, operation theatres are not upto date. Surgical equipments are quite unsatisfactory. There is no proper light in the operation theatre for operation at night. Upto date apparatus for anaesthesia and laboratory arrangements are practically non-existing. There is no provision for disinfection of infective beddings and clothings. The existing conditions call for adverse comment. Further, the nursing staff employed are deplorably short. We do not propose to continue the story. We hope, we have said enough to indicate that considerable capital expenditure will be needed in this State to improve the existing hospitals in the headquarters of districts and sub-divisions.

HONORARY PHYSICIANS AND SURGEONS:

The administration of the State managed hospitals in Assam needs a good deal of reforms. In foreign countries the co-operation of honorary physicians and surgeons, gynecologists and obstetricians is welcomed. In other big cities and towns of India they are taken in hospitals. But somehow it is not encouraged in Assam except at Gauhati. If the honorary service of the members of the profession specially qualified in different branches of the medical science is utilised wherever available, the efficiency and utility of the hospitals will be increased considerably. But this is not being done.

HOMOEOPATHY:

In the last medical conference in Hyderabad, the President has dealt at length about this subject. I need not enter into the controversy for establishing a separate Homoeopathy college or hospitals from the national Fund.

The Assam Homoeopathic Association has made a demand for it and as a result Government has set up a Committee to go into the details about it. We do not know about its findings neither it is published in the papers for the information of the public. But the fact is that at present this system is mostly practised by amateurs. Whether they start practising for a hobby or experiment or for living is very difficult to say. But it brings to a staunch devotee profit and fame as he matures in age. In these days of democracy, if some sections of the people are willing to be treated by them I have nothing to say. But what I mean to say that they should be put through the usual course of a medical degree and if at the end of successful studies they elect to practise homoeopathy or any other pathy there should be nothing to prevent them from practising it.

AYURVEDIC SYSTEM:

I now turn to a subject on which a great deal of controversy has cropped up, I mean the indigenous system of medicine—Ayurvedic. You all know that Chopra Committee suggested the proposal for integration of indigenous and modern systems of medicine. No one disputes the facts that the Ayurvedic system is hoary and famous. It served India in the past and still commands a large volume of public support. It is one thing to admit all these things, but it is quite different to say that because of these they should be accepted as scientific and integrated with the modern system of medicine.

Even the Chopra Committee did not claim perfection to this system. From the summary of the report made available to the public through the press it is clear that the confounding of medical science and medical preparations as one, has led to a considerable confusion of thought which has wrapped its outlook. Chopra Committee admits to salvage the knowledge and experience of this system. It is, therefore, for this that research in necessary. Research should aim to clear Indian Medicine of accretions of doubtful value and to make its science and art intelligible to the modern mind, and to work out a synthesis of the system.

In implementing the Committee's report, combined teaching of two separate systems of medicine, basically different, to immature young men and women who have not got a thorough grounding in one system or the other would be disastrous.

I regret to say that the system of education existing at present in many Ayurvedic Colleges is neither inspiring nor creating any confidence in the people.

TUBERCULOSIS:

You are aware that the incidence of Tuberculosis in Assam has become an alarming menace specially in the

urban and industrial areas. Tuberculosis is a community disease, and is well known to you.

Along other factors contributing to the spread of the disease are malnutrition, unhygienic housing and environmental conditions.

The purpose of a properly conducted tuberculosis survey is to provide informations on such matters as the extent of tuberculosis infection in the community concerned and the incidence of the disease in relation to age, sex and various associated factors including environmental hygiene and nutrition. It is, therefore, necessary that the State Government should make a survey of the disease.

Due to lack of adequate facilities for treatment, T. B. is taking a heavy toll of precious lives every year and is eating into the vitality of the nation. A single hospital with extremely limited facilities at Shillong and a few stray beds in a few hospitals here and there can hardly meet the problem of planned treatment with a view to provide adequate treatment for the purpose.

I, therefore, earnestly appeal to you to seriously think about it and find out ways and means how best we can help in this direction.

MEDICAL ASSOCIATION:

It is to be regretted that there are still a large number of medical practitioners who have not become members of the Association. I feel that unless each branch of this All-India organisation is fully consolidated, it will not carry the weight and influence as the mouthpiece of the profession and as a body with whom Government should negotiate when major decisions are to be made in Medical and Public Health matters.

RESOLUTIONS PASSED AT THE CONFERENCE:

1. Resolved that a deputation be immediately sent to wait upon the State Govt. for the abolition of all sorts of existing taxes on the sale of medicines, surgical and medical appliances.

2. Resolved that a sub-committee be formed with the following members to formulate a Health Scheme of the State to be placed before the Government of Assam for consideration by the Working Committee. The Scheme to be submitted to the Working Committee before 31st March, 1954.

(1) Dr. L. K. Barooah, (2) Dr. J. C. Das, (3) Dr. B. Barooah, (4) Dr. G S. Das, (5) Dr. K. C. Barooah, Convener, (6) Dr. P. C. Duarah.

3. The Committee requests the Government of Assam to include at least two representative members of I.M.A., Assam Provincial Branch, in the Selection Committee for awarding overseas medical scholarship.

4. This conference earnestly requests the State Government to expedite the passing of amendments to the Drugs Act 1940 on the lines recommended by the Anti-Spurious Drugs Committe of the I.M.A. with a view to put a stop to the manufacture and sale of Spurious and Sub-standard drugs. It further urges that the disinfectant be included in purview of the Act.

5. Resolved that Assistant Surgeon grade II should have the benefits of second class Travelling Allowance.

6. Resolved that all Headquarters of Districts should have one S.D.M.O.H.

7. Resolved that, A. S. II working in Jail should have an allowance of at least Rs. 50/- per month as compensatory to the private practice in place of Rs. 10/- per month, as current at present.

8. Resolved that A. S. grade I and A. S. grade II cadre should be amalgamated as there are no longer any production of Licentiate Doctors. A. S. grade II having 10 years of service should be given benefits as graduates in service. The Government be requested to give immediate effect to the resolution.

9. Resolved that a sub-committee be formed with the following members to deal with the grievances of the Tea Garden Doctors of the State:

Members of the Sub-Committee: 1. Dr. S. N. Dutta (Jorhat); 2. Dr. K. L. Sen Sarma (Tinsukia); 3. Dr. N. K. Bhadury (Chabua); 4. Dr. S. K. Sen (Cinnamara); 5. Dr. P. N. Ghosh (Dibrugarh), ex-President.

Dr. K. L. Sen Sarma will be the convenor and Dr. P. N. Ghosh will be the Chairman of the Sub-Committee.

The following resolutions are to be forwarded to the Sub-Committee for its dealing

(1) Resolved that, the Government be requested to intervene—so that Tea Garden doctors may get all facilities to take up the condensed M.B.B.S. Course—which has been declared minimum qualification, by the Central Health Minister to treat Indian people. One-third of the Medical Practitioners of the Province, are Tea Garden Doctors and must expect to be placed at par with those in Government Service as regards facilities and allowances to join the Condensed Course—The wish of the Government should be respected everywhere.

This Conference further requests the Union Government to intervene and make it obligatory to all Tea Garden Managers to sanction "Study Leave" to their doctors like those in Registered Government Service for the better advantage of the garden population.

(2) Resolved that the Central Government should be requested to stop anti-national foreign recruits in Tea Estates as Medical Officers—for the benefits of the Republic as there are no dearth of similar higher qualified men in India. Moreover foreign recruited people are not conversant with the system of language and physique, which has been noted by the Indian Medical Council for immediate steps.

10. Resolved that all the members of the I.M.A. should be treated on equal footing and selection for Post-graduate training in foreign countries which must not be confined to the graduates only and authorities should in future be mindful of this.

11. Resolved that All-India Medical Conference be invited to Assam in December, 1955.

N.B.—After some discussions it was decided that the venue of the conference will be at Dibrugarh; and all branches under Assam Provincial Branch, I.M.A. will participate and give all sorts of help for its success.

12. With reference to letter No. B-40/53/15422-28-L.A. dated 6/10/53 from Shri R. N. Barooah, M.Sc., B.L., Secretary, Legislative Assembly, Assam to the Assam Provincial Branch of the Indian Medical Association, P. O. Gauhati.

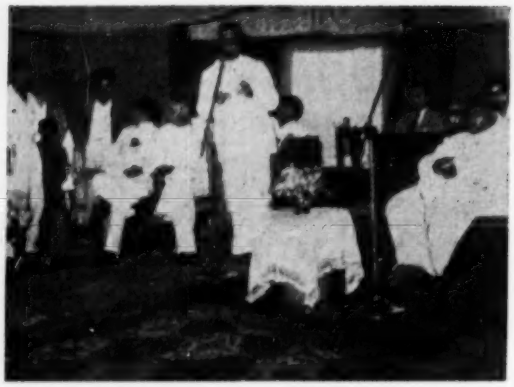
Sub.:—The Assam Homoeopathic Medicine Bill, 1953.

The House is of the opinion that no one should be recognised as a Registered Medical Practitioner unless the basic qualifications in Medical Science are acquired by them.

13. The basic Medical problem in India, is the Rural Health; so the curriculum of Medical College requires reorientation. As a first step towards that end, this conference requests the University of Gauhati to change the venue of the training ground for the preregistered period from the Medical College Wards to rural centres where anti-malarial, anti-hookworm, anti-leprotic and anti-tuberculosis centres are being established by the State Government.

VII GUJARAT & SAURASHTRA PROVINCIAL MEDICAL CONFERENCE, JAMNAGAR

The 7th annual Conference of medical men of Gujarat and Saurashtra was held at Jamnagar on 27th and 28th March 1954, under the Presidentship of Dr. P. R. Trivedi of Ahmedabad. Nearly 300 medical men from Gujarat and Saurashtra attended this session. The Rajpramukh of Saurashtra, Maharaja Jamsaheb inaugurated the conference and stressed the necessity of extending adequate medical relief to villages which had 85 per cent of our population. The Health Minister of Saurashtra opened the Pharmaceutical Exhibition and Dr. P. M. Mehta, Director, All-India Ayurveda Research Institute opened the Scientific Session and dwelt at length upon the duties of the general medical practitioner towards the suffering humanity.



THE RAJPRAMUKH OF SAURASHTRA INAUGURATES THE CONFERENCE

Dr. S. S. Baxi, the Chairman of the Reception Committee, accorded a hearty welcome to the guests and delegates, and gave a vivid history of Jamnagar, past and present.

Dr. P. R. Trivedi in course of his address said,

STUDY IN AYURVEDIC MEDICINE

It is a matter of great significance that we have all met to-day in Jamnagar, a place of pilgrimage for students of Ayurveda. It was this place that gave us great sages of Ayurveda like Shri Zandu Bhattji and Shri Bavabhai Achalji who devoted their lives to the development of this science and kept the torch of this ancient science burning in this province.

I feel it my duty to clear up one misconception that has cropped up as regards the study and revival of this ancient science. On the assumption that the modern medical practitioner is averse to the Ayurvedic system, we are, time and again, advised to encourage and adopt the Ayurvedic drugs in our day to day practice. The assumption, I may boldly say, is unfounded. As a matter of fact, the profession has always shown an open mind and has already accepted those drugs the efficacy and potency of which have been tested on scientific lines in laboratories.

I believe that the best solution for drawing out everything that is good in the ancient Ayurvedic system is to encourage firstly its study on scientific, comparative lines and to encourage this, studies of a Post-Graduate level should be introduced fostered by instituting special chairs in our Universities. In course of time, we will be the wiser for adopting this course and Ayurveda itself will have a more scientific basis. I also believe that the Institute which is already founded at Jamnagar will substantially aid research and post-graduate teaching of Ayurveda Science to the graduates of the modern Medical Colleges. I appeal to Dr. Mehta to make this hope of mine materialise by according all possible help and facilities in his research centre.

MEDICAL EDUCATION

Every one knows that there is a great paucity of qualified medical men in our Provinces and unless some radical changes are introduced we will never be self-sufficient in matters of medical relief in our province. I would suggest, among others, the following changes:—(1) to increase the number of admissions in all Medical Colleges of the Province. We have to-day in our State six medical colleges and if the suggestion is accepted we can admit at least three to four hundred more students every year to these colleges due to increased accommodation now available. (2) if necessary, as a special measure two shifts may be arranged till such time as sufficiency is reached. (3) To establish at least one Medical College immediately in Saurashtra at Bhavnagar or Rajkot over and above the existing Ayurvedic Medical College with its degree course at Jamnagar. This will greatly help the students of Saurashtra who find it difficult to get admissions elsewhere and the long cherished dream of our first two Presidents, Dr. Modi and Dr. Thakkar will have realized. A passing look at the number of candidates seeking admissions to the colleges during last three years and the actual number admitted during the period will sufficiently convince our authorities for the above demand. Gujarat University results during the last 3 years show that 1,328 students have passed the Inter Science 'B' group examination whereas total students admitted during the same period in two medical colleges of Gujarat are 310 only. A few more may have secured admissions in other colleges of Bombay state but a large majority of students desiring to take up medical career are denied admissions every year. I understand from the recent press reports that Rajkumari Amrit Kaur, the Union Minister for Health has promised substantial help from the centre for a Medical College in Saurashtra. Besides this there are medical licentiates in Province anxious for higher education for improving their prospects but restrictions are put on their admissions in our colleges inspite of the fact that Indian Medical Council has allowed admission in Medical Colleges without the pre-requisite qualification of Inter Science Examination. If all these aspiring friends are admitted in our colleges without restrictions we shall have a good number of medical graduates in our Province within next few years. Still more surprising is the attitude of those that are at the helm of the College of Physicians and Surgeons of Bombay for insisting on Inter-Science examination for the very product of their Institution desiring to go in for M.C.P.S. and F.C.P.S. examinations. I appeal to the Universities and the authorities of the College of Physicians and Surgeons that they should relax their rules and give all kinds of facilities to licentiates who would seek admission to improve their career.

Of course to run a Medical College with proper teaching staff is an expensive venture in this critical position of our country's finances which may not be able to meet with expenditure to its fullest length but it is a matter of deep satisfaction that the Government of Saurashtra has introduced for some time past the system of honorary physicians and surgeons in all the firss class hospitals of the State.

DR. P. R. TRIVEDI, THE PRESIDENT OF THE CONFERENCE

This is a progressive step which is quite in keeping with what the sister state of Bombay and other progressive States of our Republic have done. It is an excellent system which is beneficial both to the State and the general public. The people are thus enabled to have the benefit of the advice of a specialist in almost every branch of Medical Science. I hope the system will be continued and strengthened in all directions and the services of these highly qualified honoraries may well be utilised for teaching purposes when the proposed medical college in Saurashtra takes its shape. This will greatly relieve the tension of our exchequer in Saurashtra and we will be able to tide over the critical period.

RURAL MEDICAL RELIEF

The entire question of medical relief in rural areas demands very careful consideration and thorough study of the local conditions rather than hasty promulgation of new schemes and services. Besides, the type of medical relief to be offered widely differs from one for urban areas. I would therefore suggest the following investigations before any type of service is introduced in our villages:—

(1) To find out total area in miles of the district.

(2) To find total population per mile in the district.

(3) Present medical facilities available.

(4) Minimum facilities to be provided under present circumstances.

(5) Existing transport facilities.

(6) Usual incidence of the diseases in the area.

With proper co-operation and co-ordination of the State Departments it should not be difficult to collect the aforesaid data, but the most important party to the scheme is the medical personnel and how are we going to man our medical centres and units? We definitely know that there is a great paucity of qualified medical men in the country and hence the relative shortage in our provinces too. But mere complaints about shortage do not solve our problem, nor can the villages wait till our target of giving ideal service through qualified medical men in the province is reached. Under these circumstances we have to make the best of what we have at hand and supplement our qualified medical personnel from (1) either the proposed auxiliary services or (2) turn the existing medical services in the area to better account. But before finally deciding in one or the other way we must explore the reasons why we cannot attract qualified medical men to our villages. I think the answer is not far to seek. Given adequate remuneration, facilities for education of their children, facilities of work in a well-equipped dispensary or hospital, facilities to attend refresher courses and finally some special village allowances are, in my opinion, bound to attract medical men for rural medical service. I do not think the Jungles of Africa and mountains and valleys of Burma have any special attraction for so many of our qualified men if only their minimum demands are satisfied at their own doors. It is also a fact that many a Mission Hospital with fully qualified doctors are spread out throughout the length and breadth of our rural areas and these doctors have never complained of their rural surroundings. We can fulfil the object of improved medical relief in villages inspite of shortage of qualified medical men if we only remedy their grievances rather than exploit them in the name of "Sevabhav". I would therefore suggest that small health Committees be established district-wise consisting of medical men, public health workers, engineers and social workers who can jointly plan and work in alleviating and preventing the sufferings of people in rural areas before those people become too conscious about their legitimate rights of being served on the lines of their brothers in urban areas. While considering the question of qualified medical personnel it is also necessary to provide regular and qualified nursing and midwifery service for the rural areas and for the development of the latter, training centres should be opened in all first class hospitals in Gujarat and Saurashtra. As far as this Association is concernel I would like to assure the Government that our branches in Gujarat and Saurashtra will always be ready to co-operate and render all possible help in any measure introduced by Government in the matter of public health and medical relief in the province.

MEDICAL INSPECTION IN SCHOOLS AND COLLEGES

Lately the Education Department and Universities in our State have introduced Medical Inspection for their students. I suggest that whatever system of inspection be followed it must be uniform and the same be introduced right from Primary Schools till the student finishes his career. Further I believe that no method of medical inspection will be complete unless and until there is simultaneously a system of follow-up.

In order to have this ideal fulfilled I recommend that every school-going child must be provided with a "Health-Card" which should go with the student till he completes his studies. Further, proper checking of the Health-Card, periodically, should be instituted to guide the students and correct their defects pointed by Medical Inspectors. I would even go a step further and suggest that the students should not be promoted to the higher class till the remediable defects pointed out by Medical Inspectors are corrected during the year. A cursory look at the average weight of college students showing a fall of 5 lbs. of weight within a period of last five years according to reports from Bombay will attest the significance of these inspections and the follow-up and periodical checking of the Health-Cards. Further, no student should be admitted to the primary schools unless he or she has undergone preventive inoculation against small-pox, diphtheria and tuberculosis. Given a fair trial, the above suggestions will greatly help to control the incidence of tuberculosis and such infectious diseases amongst our growing generation and create in the general public both civic and medical sense. In this respect I must congratulate the School Board Authorities of Ahmedabad Municipal Corporation for establishing a special clinic for periodical check-up of health of the primary school children under their control.

QUACKERY AND THE PROFESSION

Every day complaints are pouring in from members of our profession for the growing menace of quackery in our province. This is not new. I would inform my friends that even in the highly civilized countries quackery does exist. It may be that with us it has reached alarming proportions. Further, our Governments have assumed that by passing Medical Practitioners' Act in Bombay and Saurashtra they have eliminated quackery. We wish it were so. From my present knowledge, I would cite instances of a hospital barber, another a tutor of my child, a mill jobber and a press representative all of whom claim to be registered medical practitioners and share the privileges of the profession with all of us! With a view to preventing quacks dispensing to their victims any kind of drug, it is very necessary that the provisions of the Drug Control Acts and rules be made more stringent and more rigidly enforced in our States.

E. S. I. SCHEME

You are all aware that very soon this much discussed scheme will be implemented in the State of Bombay. I think that difficulties and inconveniences may have to be experienced to begin with but after all it is a great step towards socialisation of medical services on a large scale and the profession should extend its helping hand to make this National Scheme a success even at some personal loss and sacrifice for this noble cause.

In conclusion, I implore every medical practitioner to remember the Hippocratic (Unani) Oath and the Vedic Principles of Medicine and to observe medical etiquette in his relations with the State, with other practitioners and with his patients.

RESOLUTIONS PASSED AT THE CONFERENCE:

1. This Conference records with intense grief the sad demise of the following members of the G. & S. Prov. Branch—

(1) Dr. C. G. Shah—Ahmedabad.
(2) Dr. Mrs. Kusumben Dholabhai—Surat.
(3) Dr. B. U. Purohit—Rajpipla.

Conference extends its condolences and sympathies to the members of the bereaved families.

2. In view of the present statement made by the Hon'ble Minister of Health, State of Saurashtra, the Conference requests the Govt. of Saurashtra to expediate the matter of opening a Medical College in Saurashtra.

3. This Conference appreciates the prompt action of the Central Govt. in affording facilities to the qualified medical persons for Post-Graduate Research work in the indigenous system of medicine at the Jamnagar Central Research Institute and allotting enough number of beds for research work.

4. This Conference requests the Govt. of Saurashtra to give more representation to the elected members than the nominated ones of the medical profession to the Saurashtra Medical Council.

5. This Conference urges upon the Govt. of Saurashtra to utilise the services of the Honorary Medical Officers in all the District Hospitals as laid down in the basic rules for the appointment of such Honorary Medical Officers.

6. This Conference requests the Govt. of Saurashtra to implement the Food Adulteration Act and requests the Saurashtra Municipalities to execute the same as to prevent this scourge which is detrimental to the health of people.

7. This Conference requests the Govts. of Bombay and Saurashtra to provide adequate funds for medical and public health affairs for the Five Year Plan to make special provision for putting more emphasis on the prevention of diseases.

8. That this Conference requests the Govt. of Saurashtra and other local bodies in Gujarat and Saurashtra to provide conveyance allowances to the Honorary Medical Officers and the schedule of fees in Hospitals as fixed by the Govt. of Bombay in the special wards where special ward exist.

9. This Conference regrets to find that the Govts. of Bombay and Saurashtra have not taken any measure as to fulfil the recommendations in Resolution No. 6 of 3rd Prov. Conference held at Surat (the copy of the same is attached herewith for ready reference).

This Conference requests the Hon'ble Minister for Medical and Health Services in the States of Saurashtra and Bombay and the Western Railway authorities to adopt the following cadres in lieu of the existing ones:—

(1) *Special Grade*: for Chief Medical Officers who would be the head of the medical and health services (Surgeon-General of the Province) and the Chief Medical Officers of Railways:

Rs. 1800—100—2500 p.m.

(2) *Class I*: *Senior Scale*: Medical Officers of Districts and Dist. Medical Officers of Railways:—

Scale Rs. 900—100—1800 p.m. Fifty per cent of this cadre should be appointed by direct recruitment and fifty per cent to be promoted from the Junior Scale after 10 years' service.

Junior Scale: For Deputy Dist. Medical Officers in civil as well as in the Railway employment:—

Pay Rs. 500—40—800 p. m. Recruitment 50 per cent directly and 50 per cent from senior scale after 5 years approved service from class II.

(3) *Class II*: *Senior Scale*: Senior Medical Officers: Pay —Rs. 250—40—800 p. m. Recruitment: 50 per cent directly. Qualifications: Graduates of recognised University.

50 per cent to be promoted after 8 years' approved service in junior scale. *Junior Scale*: for the present S.M.S. officers to be designated as Junior Medical Officer: Pay Rs. 200—30—500 p.m. Present S. M. S. officers should be absorbed in this grade. Members of Cl. I shall be regarded as 1st Cl. Gazetted officers and members of the Cl. II as Second Cl. Gazetted officers until they are promoted to the Cl. I.

10. This Conference supports fully the prohibition policy of Govts. of Saurashtra and Bombay.

I BOMBAY PROVINCIAL MEDICAL CONFERENCE, BOMBAY

The first Bombay Provincial Medical Conference was held on 17 April 1954 at the Anatomy Theatre, Grant Medical College, Bombay. The Conference was inaugurated by Shri Dinkerrao Desai, Minister for Education and Law, Government of Bombay. Dr. C. S. Patel presided over the conference.

The Bombay State branch presented an address to Dr. Patel, enumerating his services to the medical profession and extolling him as a pioneer of medical education and relief and wishing him a long and healthy life dedicated to "Service, sacrifice and selflessness."

Dr. Patel in his presidential address, discussed the various problems that are confronting the medical profession and the country. Excerpts from his address are given below:

"It is true that Governments in various States in India have sanctioned the opening of rural medical centres all over the States, but due to reasons which are not far to seek, many of these centres have remained unopened.

It is impossible to expect a new medical graduate to settle in a village unless proper arrangements for the schooling of his children and proper facilities for social intercourse for the members of his family exist. It is also necessary that he should have a proper income to enable him to enjoy a modicum of comfort.

Then again, we in Bombay are still following the old system under which medical and public health departments are treated as two distinct units and these work in two watertight compartments, although several other provinces have combined their medical and public health departments and are running them as a single unit. I have been feeling that, inspite of our best efforts, we are always 25 years behind the times. By the time we improve our medical institutions and public health systems, every time we find that other advanced countries have already progressed considerably and that it will take us another 25 years to reach their levels.

Our notions about preventive and curative medicine have changed considerably during the last few years, and it is now an accepted fact that neither can be divorced from the other. Actually at present all over the world, preventive medicine is considered more important than curative medicine, and I feel that we, as medical men, owe a duty to society to see that diseases are prevented rather than take credit for curing them after they are allowed to affect our systems.

At present general practitioners all over India naturally concentrate on curing diseases, because under the system they are paid on the basis of the treatment given by them, and they hardly attend to the preventive side, while the officers and staff of the Public Health Department rarely come in contact with the general practitioners.

Actually Public Health Departments in India now concentrate their activities on stamping out epidemics when they occur and on matters like sanitation, drainage, etc. There is hardly any co-ordination between the preventive and the curative side, with the result that a heavy toll of life is taken every year.

To make matters worse, malnutrition is common in every part of India and sufficient attempts have not been made by Government to conquer this deadly foe of humanity. You have only to see the average man in India and compare him with the inhabitants of other countries to find that the majority of our people are very poorly built. This is due to the fact that most of our countrymen do not get food adequate for the needs of their systems, and whatever little they get is not of the best quality. They know nothing of a balanced diet—indeed they cannot afford to pay for one—and they thus suffer from all the ill effects of malnutrition. They cannot build up sufficient resistance to diseases and, when an epidemic breaks out, they die like flies.

It is my firm belief that whatever we may do in the way of medical relief, so long as we do not take steps to ensure that every man in this countrty gets enough to eat in the shape of a balanced diet everyday, all Medical and

Public Health measures taken by us will be of no avail. This explains why, inspite of all our best efforts, the average expectation of life for men in India is much less than that of men living in other countries.

India is a land of villages, and it is the villagers who form the backbone of the community, who grow all the food we need and who have to toil and sweat day and night for this. Yet, there are practically no arrangements for medical relief in a large number of villages, and it is an irony of fate that the farmer who toils and sweats for us to give us food to keep us alive, practically receives no medical attention when he is seriously ill. Most of our villages are not properly connected by roads and it is obvious that, in cases of serious illness, it is practically impossible to remove patients from such villages without roads to hospitals, where proper facilities for their treatment exist. The prime necessity of the day is more and more roads, so that villagers may not only be able to obtain necessary medical facilities when they need them, but may also be able to move their farm produce to selling centres without much cost and trouble.

It is axiomatic that the cost of medicines which help to cure diseases and prolong life, should be as cheap as possible. Drugs and medicines, which may appear reasonably costly to the upper strata of the society are bound to prove to be out of the reach of the common man. Therefore it is advisable that all taxes on Drugs and medicines—namely Sales Tax and General Sales Tax—should be as low as possible to enable the common man to get the benefit of the essential medicines at a lower cost.

I will now refer to the Drugs Act 1940, which is now being implemented all over the State. As a result of the rigorous enforcement of the Act, by our able and enthusiastic Drugs Controller, there has been a wholesome check on the manufacture and distribution of the spurious and sub-standard drugs. However, I must point out that due to the inadequacy of the staff at the disposal of the Drugs Controller, his efforts have not succeeded to the fullest extent. I fervently hope that the Government may provide sufficient machinery in this respect, to minimise the traffic of spurious and sub-standard drugs.

The excuse of financial stringency is a sort of magic wand with the Government and it covers a multitude of sins and omission and commission. Just before and after the attainment of independence most of the Provincial Governments opened a number of Medical Colleges in their respective states, although they must have been aware at the time they opened them that they had neither adequate funds, nor adequately qualified personnel to run them and they expected the Medical Council of India to recognise them despite these shortcomings. I am glad to say that the Medical Council took a firm stand and refused to recognise such institutions until they were brought up to the required standard, with the result that Government soon found funds to effect the necessary improvement and equip the colleges properly. I am sure that, if the Medical Council had accepted the plea of financial stringency from the Government, and recognized these colleges, they would have continued to be ill-equipped and ill-manned for another quarter of a century.

Incidentally this shows that Government can always find funds when they want really to do so, and it seems to me that much better results could have been obtained in a much shorter time if, instead of frittering away their resources on all sorts of schemes, they had concentrated on certain essential schemes, and medical relief should have had top priority in any beneficial scheme of the Government.

SHRI DINKERRAO DESAI INAUGURATED THE CONFERENCE. *Seated left to right*: DR. C. S. THAKAR, DR. C. S. PATEL AND DR. S. S. UGRANKAR

It appears to me that we shall be able to attain much needed co-ordination between the curative field and the preventive field in medicine if a social health insurance scheme is evolved for the entire population of India. The question of general practitioners concentrating on the curative side in preference to the preventive, will not then arise, as they will be assured of a steady income, irrespective of the number of cases they have to treat. Such schemes are already in existence in the U. K. and Russia, and it should be our aim to have a similar scheme in India as soon as possible.

In 1952, when it was expected that Employees' State Insurance Scheme will be implemented in the Bombay State in the near future, I took up the matter in right earnest and called a meeting of the Profession and organised a Medical Consultative Committee representing the various associations and the profession in Bombay, to deal with the matter. This Committee carried on negotiations with the local authorities of the Corporation with regard to the terms of service and the capitation fee for Panel Doctors working under the scheme. At this moment, the negotiations between the Ministry of Labour and the Indian Medical Association at the centre, have resulted in an agreement for the acceptance of the terms of service, on an all-India basis. I fervently appeal to the members of the profession that they should remain together. The united front can represent actively, if modification of the capitation fees is required at a very near future date and the Government will have to yield to the pressure of the united front.

However, I feel that, in a matter like this, which affects the health of the people of the State as a whole, we the members of the Medical fraternity, should independently of

the Government, embark on a scheme of Health insurance immediately, covering the richer and the middle class people and such others who may care to join it. I suggest that we should fix Rs. 15/- per annum per individual as the charge which will be made for the members of the public joining the scheme. This means that a person with a total of five members in his family, including himself, will have to spend only Rs. 75/- per annum on health insurance. This is really a very moderate charge and I feel that the bulk of the ordinary middle class population in this State should not find it difficult to join this scheme, especially when it is realised that the scheme offers them all medical aid, including mixtures, visits and ordinary medicines. Of course when special costly medicines are required for treatment, the patients will have to pay for them themselves.

I feel that, if we start a scheme on these lines immediately, we will not only be doing a lot of public service but also solving the question of inadequate payment by the Government of India with regard to E.S.I. Scheme. Universal social health insurance is bound to come sooner or later and we should catch time by the forelock and make a beginning now alone. I suggest that the Indian Medical Association and its provincial branches should take an active part in starting a scheme of this kind.

I have briefly referred to the question of medical education earlier in my speech and explained how the Medical Council of India had to fight against vested interests in maintaining proper standards. For reasons which we have yet to learn, the present Ministry of Health issued orders a few years ago appointing a separate Council to look after post-graduate medical education, despite the fact that, under the Indian Medical Council Act, all medical education of the University standard, including post-graduate medical education, is the responsibility of the Medical Council of India. Inspite of the fact that the appointment of the Council was contrary to the statute—and this fact was brought to the notice of the Ministry—the committee was continued in existence from year to year, and now I understand that the Health Ministry of the Government is making frantic efforts to pass an amendment to the Indian Medical Act to legalise its illegal action and to transfer all powers and control of post-graduate education to the said council.

The action of the Health Ministry in attempting to form another Committee or Council to deal with post-graduate medical education can only be considered a retrograde measure. I am sure that the entire Medical Profession not only in this State, but in all the States in India will voice its vigorous opposition to this ill-advised action of the Health Ministry of the Government of India.

It is regretted that in these days of scientific training and advancement, we should find a very large percentage of quacks still practising in our midst. The reason for this is that, when the Bombay Medical Practitioners Act, 1938, was passed, it was found necessary to permit all persons who were practising medicine before a specified date to continue to do so, irrespective of whether they possessed recognized medical qualifications or not. It has resulted in thousands of compounders and an enormous number of homoeopaths and others who had never stepped into the portals of a recognized medical institution being allowed to practise. It was thought at one time that by bringing them under the control of the Board of Indian systems of medicine, it would be possible to eliminate most of the persons who were mere quacks and were following unethical practices. However, as a matter of fact, nothing of the kind has happened and not only do the enlisted quacks advertise in the press and on the screen, but they use also the radio for their propaganda purposes, and no action is taken against them either by the Board or by any Officer of the Government competent to do so. There are several others who are using very large boards—as long as their consulting rooms—to advertise themselves. I wish that the authorities of the Board of the Indian systems of medicine or of the Government of Bombay concerned should look into the matter and take suitable action to prevent these quacks who do not seem to be amenable to any rules or regulations, from blatantly advertising themselves and misleading the public.

BRANCH NOTES

BEGUSARAI BRANCH—An emergent meeting of the branch was held on 18-4-54 to condole the death of Dr. J. P. Sinha, Civil Surgeon, Monghyr.

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A meeting of the branch was held on 3-5-54. It was felt desirable to improve the clinical aspect of the meeting. It was suggested to have a building of the branch.

BENGAL PROVINCIAL BRANCH—A meeting of the Council of the branch was held on 19-12-53 with Dr. A. K. Bose in the chair. Forty-two members were present. The members condoled the death of Dr. A. N. Ghosh, a past president of the Bengal Prov. Branch. Members for the Working Committee of the Bengal Prov. Council were elected. Members for the different Standing Committees were also elected. Regarding arrangement for Refresher Course, it was decided to send a circular to all branches for opinion. To select the venue and date of the next Rural Medical Conference, the Provincial Secretary was requested to send a circular to all branches inviting the same.

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A meeting of the Working Committee of the branch was held on 24-2-54 with Dr. A. K. Bose in the chair. Twenty-four members were present. At the outset the members condoled the death of Mrs. K. K. Sengupta, wife of Dr. K. K. Sengupta under tragic circumstances at Kumbha Mela. It was decided that a joint meeting of the Bengal Prov. Branch and the Calcutta Branch would consider (1) the question of financial help under different heads to the Calcutta branch, (2) publication of News and Views under the joint auspices of Bengal Prov. Branch and Calcutta Branch (3) Calcutta Branch's letter to Central office for propaganda grant. The report of the Health Services Standing Committee was adopted. The members were requested to attend the rural medical conference to be held at Pandua on 28-2-54.

DEHRA DUN BRANCH—A meeting of the branch was held on 8-12-53 with Dr. S. K. Shome in the chair Twenty-seven members and four guests were present. Dr. R. M. Sharma read a paper on Acute Abdomen. A condolence resolution was passed on the death of Dr. T. S. Tirumurti.

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A meeting of the branch was held on 16-1-54 to meet Dr. B. D. Mistry on the eve of his departure to Bombay. Twenty-four members were present.

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A special meeting of the branch was held on 17-1-54 at Jamnipur, Camping grounds, 13 miles from Dehra Dun. The members and guests participated in sports.

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A meeting of the branch was held on 1-2-54 with Dr. S. K. Shome in the chair. Dr. Ram Murti read a paper on Eosinophilia with particular reference to Tropical Eosinophilia.

* * * *

A meeting of the branch was held on 1-3-54 with Dr. S. K. Shome in the chair. Nineteen members and three guests were present. Dr. Maini read case notes on Cerebral Tumour, secondary to tumour of the uterus. Dr. Ram Murti gave a vivid description of All-India Medical Conference.

DEORIA BRANCH—A meeting of the branch was held on 31-1-54 with Dr. S. C. Acharya in the chair. The members condoled the death of Dr. A. N. Ghosh the founder secretary of the Journal of I.M.A. The meeting demanded the amendment of the Drugs Control Act or adopt any other measure to exterminate the traffic in spurious drugs. It suggested a reduced rate of electricity to chemists and druggists for maintaining refrigerators. The enhancement of C.F.C. was not approved. Dr. Mahendra read a paper on Rabies and Dr. Mukherjee discussed a case of severe abdominal pain.

* * * *

A meeting of the branch was held on 6-3-54 with Dr. S. C. Acharya in the chair. The members condoled the death of Dr. H. Hukku. Dr. S. N. Mukherjee demonstrated a case of Abdominal Pain. Dr. Maitra cited a case of Paralysis Agitans and Dr. C. R. Mukherjee cited a case of Procaine Penicillin reaction.

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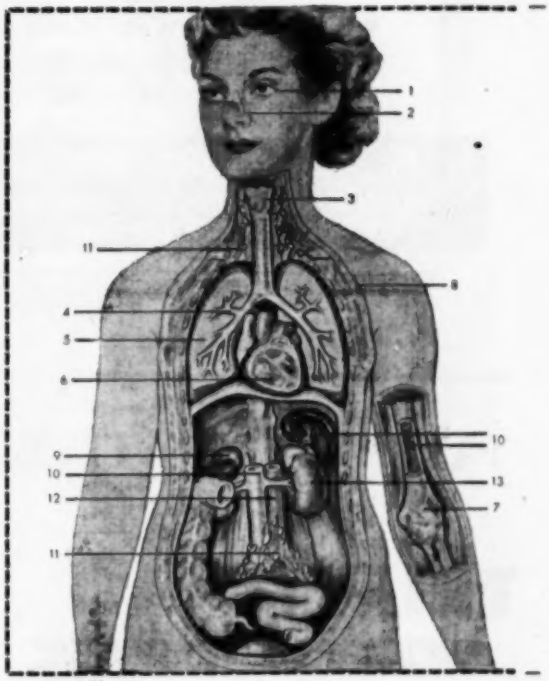

Primary site of pathology	*Indications*
1. EYE	Inflammatory eye disease
2. NOSE	Intractable hay fever
3. LARYNX	Laryngeal edema (allergic)
4. BRONCHI	Intractable bronchial asthma
5. LUNG	Sarcoidosis
6. HEART	Acute rheumatic fever with carditis
7. BONES AND JOINTS	Rheumatoid arthritis Rheumatoid spondylitis Acute gouty arthritis Still's Disease Psoriatic arthritis
8. SKIN AND CONNECTIVE TISSUE	Pemphigus Exfoliative dermatitis Atopic dermatitis Disseminated lupus erythematosus Scleroderma (early) Dermatomyositis Poison Ivy
9. ADRENAL GLAND	Congenital adrenal hyperplasia Addison's Disease Adrenalectomy for hypertension, Cushing's Syndrome, and neoplastic diseases
10. BLOOD BONE MARROW, AND SPLEEN	Allergic purpura Acute leukemia† (lymphocytic or granulocytic) Chronic lymphatic leukemia†
11. LYMPH NODES	Lymphosarcoma† Hodgkin's Disease†
12. ARTERIES AND CONNECTIVE TISSUE	Periarteritis nodosa (early)
13. KIDNEY	Nephrotic Syndrome, without uremia (to induce withdrawal diuresis)
14. VARIOUS TISSUES	Sarcoidosis Angioneurotic edema Drug sensitization Serum sickness Waterhouse-Friderichsen Syndrome

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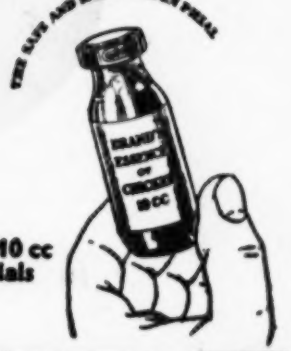

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Pulaski, E. J., and others: *J. A. M. A.* 152:35 (MAY 2) 1953.

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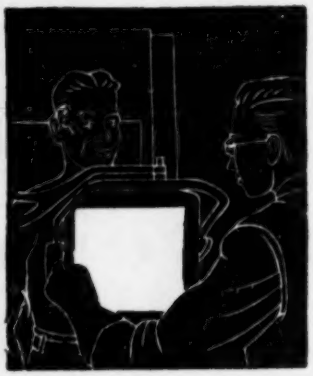

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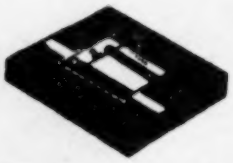

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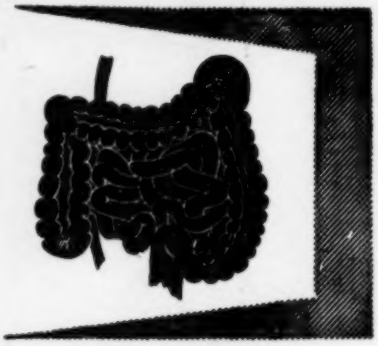

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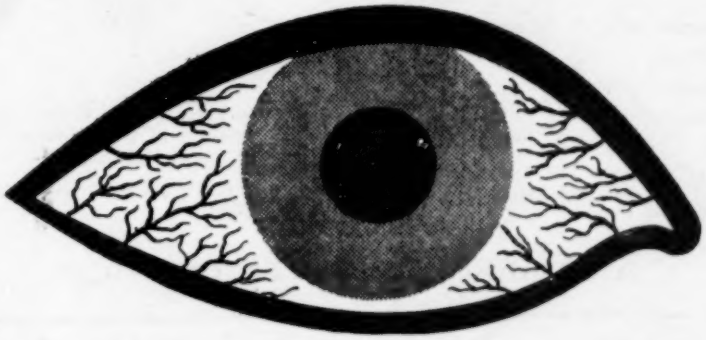

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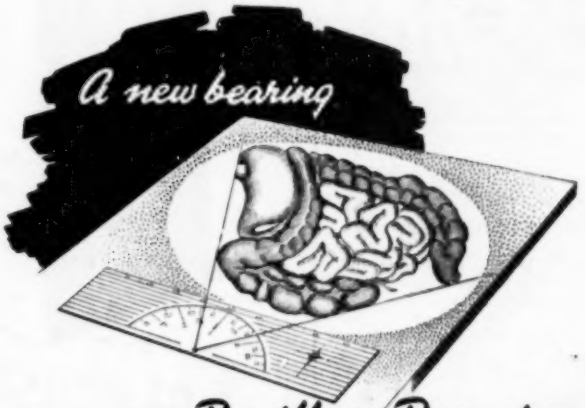

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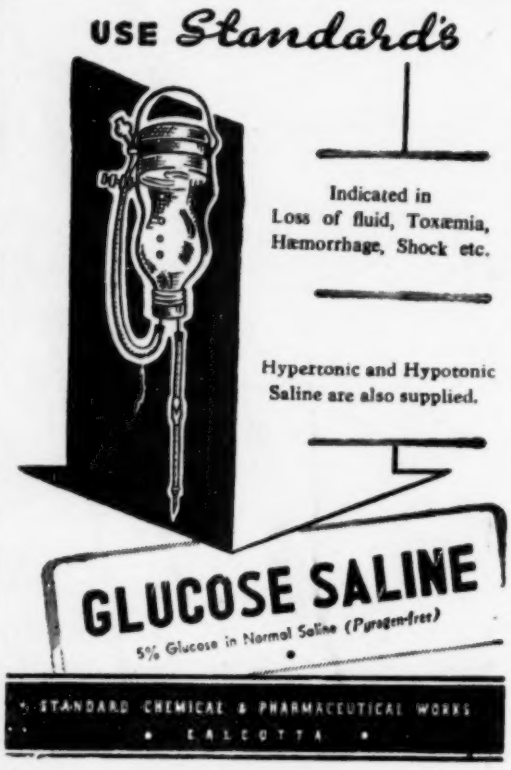

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FORTNIGHTLY
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